Vol. 1007 Number 3

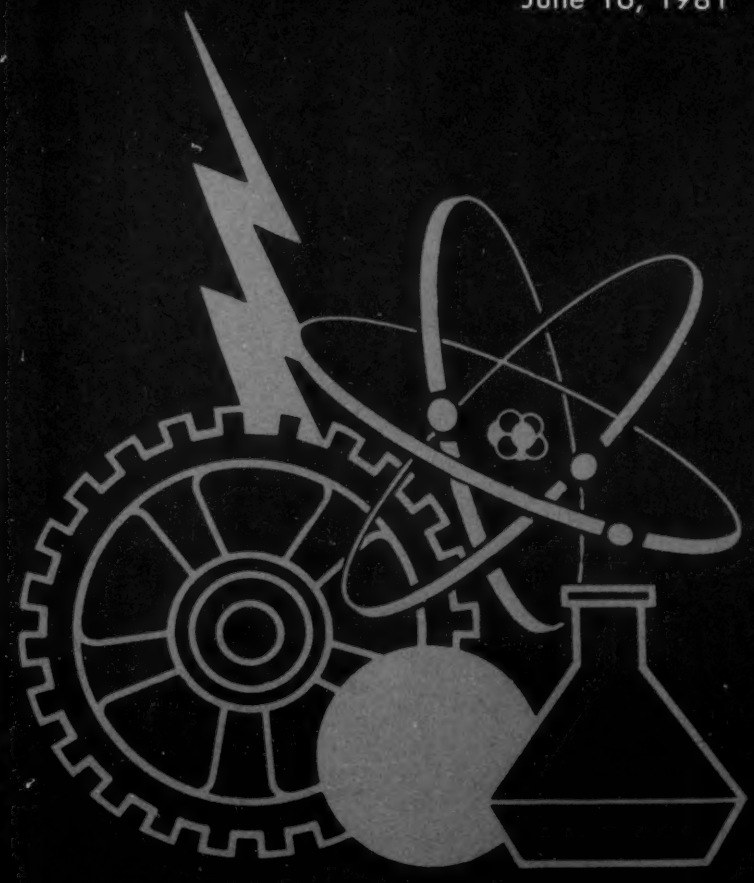
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

June 16, 1981



U.S.
DEPARTMENT
F COMMERCE

Patent
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Trademark
Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

June 16, 1981 Volume 1007 Number 3

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THE OFFICIAL GAZETTE (PATENTS SECTION), issued weekly, subscription $300.00 per annum for first-class mailing, also available as fourth-class mail at $200.00; foreign first-class mailing rates will be furnished upon request; single copies each, $4.00 domestic, $5.00 foreign.

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT, consult Chapter 1800 of the Manual of Patent Examining Procedure and notices 90–95 in the consolidated listing of notices appearing in the Official Gazette of Jan. 6, 1981.

The PCT fees in effect after May 19, 1981 are as follows:

Transmittal fee	$ 35.00
Search fee	300.00
International Basic Fee (for the first 30 sheets of an international application)	215.00
Basic Supplemental Fee (for each sheet over 30)	4.00
International Designation Fee (for each State for which a national patent is sought, or group of States for which the same regional patent is sought)	50.00

RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,720,351, Re. S.N. 248,377, Filed Mar. 27, 1981, Cl. 222/1, PULVERIZED FUEL DELIVERY SYSTEM FOR A BLAST FURNACE, Earl E. Coulter, et al., Owner of Record: *The Babcock & Wilcox Co., New Orleans, La.,* Attorney or Agent: R. J. Edwards, et al., Ex. Gp.: 311

3,733,438, Re. S.N. 230,874, Filed Feb. 2, 1981, Cl. 370/69, CARRIER SUPPLY FOR FREQUENCY DIVISION MULTIPLEXED SYSTEMS, Thomas John Haley, et al., Owner of Record: *Bell Telephone Laboratories, Inc., Murray Hill, N.J.,* Attorney or Agent: S. E. Hollander, et al., Ex. Gp.: 236

3,808,178, Re. S.N. 215,486, Filed Dec. 11, 1980, Cl. 257/351, OXYGEN-PERMEABLE CONTACT LENS COMPOSITION, METHOD AND ARTICLE OF MANUFACTURE, Norman Gaylord, Owner of Record: *Mesne Assignts. to Syntex (U.S.A.) Inc., Palo Alto, Calif.,* Attorney or Agent: Joseph I. Hirsch, et al., Ex. Gp.: 257

3,991,717, Re. S.N. 178,306, Filed Aug. 15, 1980, Cl. 119/19, KENNEL, CIRCULAR FACILITY, Robert Royce Buchanan, Owner of Record: *Inventor,* Attorney or Agent: David A. Boone, et al., Ex. Gp.: 333

4,103,001, Re. S.N. 243,806, Filed Mar. 16, 1981, Cl. 424/128, BUFFERED PHENOL-GLUTARALDEHYDE STERILIZING COMPOSITIONS, Robert I. Schattner, Owner of Record: *Inventor,* Attorney or Agent: Morris Fidelman, et al., Ex. Gp.: 125

4,123,359, Re. S.N. 193,520, Filed Oct. 2, 1980, Cl. 210/169, WATER PURIFYING SYSTEM AND PUMP THEREFOR, John D. Smith, Owner of Record: *Bernard L. Kleinke, Des Plaines, Ill.,* Attorney or Agent: Bernard L. Kleinke, Ex. Gp.: 176

4,140,431, Re. S.N. 231,426, Filed Feb. 4, 1981, Cl. 407/114, CUTTING INSERT, Ernest J. Friedline, et al., Owner of Record: *Kennametal Inc., Latrobe, Pa.,* Attorney or Agent: Lawrence R. Burns, et al., Ex. Gp.: 324

4,146,048, Re. S.N. 247,820, Filed Mar. 26, 1981, Cl. 137/75, FIRE DAMPER AND METHOD OF FABRICATION, Francis J. McCabe, Owner of Record: *Prefco Products, Inc., Buckingham, Pa.,* Attorney or Agent: Frank J. Benasutti, et al., Ex. Gp.: 341

4,185,395, Re. S.N. 243,364, Filed Mar. 13, 1981, Cl. 34/12, METHOD FOR THERMAL DEHYDRATION OF BROWN COAL, Yukio Nakako, et al., Owner of Record: *Kobe Steel, Ltd., Kobe City, Japan,* Attorney or Agent: Norman F. Oblon, et al., Ex. Gp.: 344

4,220,164, Re. S.N. 230,732, Filed Feb. 2, 1981, Cl. 131/84 R, TOBACCO DISTRIBUTOR FOR CIGARETTE ROD MAKING MACHINES OR THE LIKE, Heinz-Christen Lorenzen, Owner of Record: *Hauni-Werke Korber & Co., KG., Hamburg, Germany,* Attorney or Agent: Peter K. Kontler, et al., Ex. Gp.: 335

4,229,504, Re. S.N. 229,050, Filed Jan. 28, 1981, Cl. 428/461, A POLYOLEFIN COMPOSITION HAVING HIGH IMPACT RESISTANCE AND HIGH TEMPERATURE FLOW RESISTANCE, Armand E. Brachman, Owner of Record: *Bethlehem Steel Corp., Bethlehem, Pa.,* Attorney or Agent: Joseph J. O'Keefe, et al., Ex. Gp.: 164

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Post Office as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Morabito Boutique, Paris, France; Reg. No. 857,670, Canc. No. 12,844.

Krypton Electronics, Inc., New York, N.Y.; Reg. No. 1,032,131, Canc. No. 12,858.

Flair Originals, Inc., New York, N.Y.; Reg. No. 811,063, Canc. No. 12,869.

ERMA S. BROWN,
Deputy Clerk, Trademark Trial and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

DEPARTMENT OF COMMERCE
Patent and Trademark Office
AUTOMATION STUDY

AGENCY: Patent and Trademark Office, Commerce
ACTION: Notice of Automation Study

SUMMARY: The Patent and Trademark Office invites public participation in a study for fully automating the operations of the Office. Such automation efforts are intended to modernize the PTO's patent, trademark, information dissemination and administrative management programs. The final report of this study, which is required by Section 9 of P.L. 96-517, will be submitted to the Congress on or before Dec. 12, 1982.

DATES: Written comments must be submitted on or before July 23, 1981; public hearing, July 23, 1981, 9:30 a.m.; requests to present oral comments should be received on or before July 16, 1981.

ADDRESSES: Address written comments and requests to present oral testimony to the Commissioner of Patents and Trademarks, Washington, D.C. 20231. The hearing will be held in Room 11C24 of Bldg. 3, Crystal Plz., located at 2021 Jefferson Davis Hwy., Arlington, Va. Written comments and a transcript of the public hearing will be available for public inspection in Room 11E10 of Bldg. 3, Crystal Plz. at 2021 Jefferson Davis Hwy., Arlington, Va.

FOR FURTHER INFORMATION CONTACT: Mr. Bradford R. Huther by telephone at (703) 557-1572 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Wash., D.C. 20231

SUPPLEMENTARY INFORMATION: Section 9 of P.L. 96-517 is the basis for the development of the automation plan.

"Sec. 9. The Commissioner of Patents and Trademarks shall report to Congress, within two years after the effective date of this Act [Dec. 12, 1980], a plan to identify, and if necessary develop or have developed, computerized data and retrieval systems equivalent to the latest state of the art which can be applied to all aspects of the operation of the Patent and Trademark Office, and particularly to the patent search file, the patent classification system, and the trademark search file. The report shall specify the cost of implementing the plan, how rapidly the plan can be implemented by the Patent and Trademark Office, without regard to funding which is or which may be available for this purpose in the future."

The areas proposed for study include patent automation, trademark automation, information dissemination, integrated resources management, office automation and legal decisions. Public participation is intended to insure the maximum potential for all automation opportunities to be addressed. Following the identification of automation opportunities, alternative approaches to support them will be developed and the feasibility costs and benefits associated with each will be determined.

RENE D. TEGTMEYER
May 14, 1981. *Acting Commissioner of Patents and Trademarks.*

ROBERT B. ELLERT
May 19, 1981. *Acting Assistant Secretary for Productivity, Technology, and Innovation.*

Withdrawal of Extension of Time for Filing Notices of Opposition

By means of an Official Gazette announcement dated January 30, 1981, the Patent and Trademark Office granted an automatic 14-day extension of time for filing Notices of Opposition beginning with the Official Gazette issue dated January 13, 1981. Beginning with the Official Gazette issue dated June 9, 1981, the automatic extension is no longer in effect.

MARGARET M. LAURENCE,
Jun. 2, 1981. *Assistant Commissioner for Trademarks.*

PATENT NOTICES

Certificates of Correction for the Week of June 16, 1981

Re. 30,445	4,235,602	4,246,949	4,254,942
4,084,063	4,235,754	4,247,606	4,255,059
4,155,646	4,235,889	4,247,656	4,255,282
4,184,155	4,236,363	4,247,932	4,255,362
4,185,909	4,236,527	4,247,939	4,255,371
4,187,651	4,236,700	4,248,314	4,255,504
4,188,974	4,237,100	4,248,338	4,255,553
4,189,455	4,237,119	4,248,615	4,255,643
4,191,513	4,237,362	4,248,673	4,256,000
4,191,532	4,237,503	4,248,957	4,256,061
4,199,574	4,238,355	4,248,962	4,256,063
4,199,605	4,238,635	4,249,100	4,256,073
4,206,577	4,239,514	4,249,446	4,256,132
4,209,390	4,239,621	4,249,904	4,256,174
4,211,797	4,240,034	4,250,038	4,256,315
4,215,265	4,240,598	4,250,134	4,256,376
4,215,300	4,240,622	4,250,318	4,256,435
4,216,834	4,241,329	4,250,451	4,256,451
4,220,512	4,241,807	4,250,497	4,256,694
4,220,758	4,241,835	4,250,883	4,256,769
4,221,788	4,242,069	4,251,130	4,257,062
4,222,905	4,242,331	4,251,734	4,257,145
4,223,795	4,242,355	4,251,782	4,257,152
4,225,411	4,242,513	4,252,269	4,257,175
4,228,339	4,243,060	4,252,308	4,257,772
4,228,902	4,243,157	4,252,552	4,257,837
4,229,399	4,243,553	4,252,751	4,257,841
4,229,579	4,243,577	4,253,095	4,257,914
4,230,736	4,243,988	4,253,270	4,257,980
4,230,900	4,244,096	4,253,315	4,257,981
4,231,039	4,244,988	4,253,409	4,257,982
4,231,158	4,245,313	4,253,453	4,257,983
4,231,220	4,245,353	4,253,474	4,258,508
4,231,365	4,245,363	4,253,602	4,259,801
4,231,375	4,245,626	4,253,973	4,259,935
4,232,335	4,245,710	4,253,978	4,259,988
4,232,338	4,245,800	4,254,259	4,260,370
4,233,989	4,245,885	4,254,378	4,260,431
4,234,821	4,246,075	4,254,721	4,260,436
4,235,500	4,246,397		

National Technical Information Service

U.S. GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and, possibly, foreign licensing.

Copies of patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of patent applications cited are available from the National Technical Information Service (NTIS), Springfield, Va. 22161 for $5.00 each ($10.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to avoid premature disclosure. Claims and other technical data will usually be made available to serious prospective license upon execution of a non-disclosure agreement.

Requests for information on the licensing of particular inventions should be directed to:

Office of Government Inventions and Patents
U.S. Department of Commerce
P.O. Box 1423
Springfield, Va. 22151

DOUGLAS J. CAMPION,
Program Coordinator,
Office of Government Inventions and Patents
National Technical Information Service
U.S. Department of Commerce.

U.S. DEPARTMENT OF AGRICULTURE

Program Agreements and Patent Branch
Administrative Service Division Federal Building
Science & Education Administration
Hyattsville, Md. 20782

Patent application 6-212,297. Process for Producing Transfer Printed Cotton and Cotton Blends. Filed Dec. 3, 1980.

Patent 4,236,890. Process for Producing Transfer Printed Cotton and Cotton Blends. Filed June 7, 1978. Patented Dec. 2, 1980. Not available NTIS.

Patent 4,246,289. Novel Aroid Products. Filed July 5, 1979. Patented Jan. 20, 1981. Not available NTIS.

U.S. DEPARTMENT OF ENERGY

Assistant General Counsel for Patents
Washington, D.C. 20545

Patent application 6-101,368. Flash Protection Controller. Filed Dec. 7, 1979.

Patent application 6-101,369. Waveform Synthesizer. Filed Dec. 7, 1979.

Patent 4,197,285. Regeneration of Lime from Sulfates for Fluidized-Bed Combustion. Filed Dec. 7, 1977. Patented Apr. 8, 1980. Not available NTIS.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

National Institutes of Health
Chief, Patent Branch
Westwood Building
Bethesda, Md. 20205

Patent application 6-186,735. Anti Thy 1.2 Monoclonal Antibody-Ricin Hybrid Utilized as a Tumor Suppressant. Filed Sept. 30, 1980.

Patent application 6-210,044. Acoustically Transparent Hydrophone Probe. Filed Nov. 24, 1980.

U.S. DEPARTMENT OF THE INTERIOR

Branch of Patents
18th and C Streets, N.W.
Washington, D.C. 20240

Patent application 6-184,851. Multi-Chromatographic Materials. Sept. 8, 1980.

Patents Available for Licensing or Sale

3,927,282. BUTTONS FOR ATTACHMENT TO PUSHBUTTON TELEPHONE KEYS. *Harold S. Firstenberg,* Imagineering Industries, 36 Berry St., San Francisco, Calif. 94107.

4,059,995. LEVEL INDICATORS FOR LIQUIDS. *Raul Calderon DePalacio,* Pennsylvania 171 Mexico 18, D. F.

4,064,999. ADJUSTABLE BUILDING PANEL SCAFFORD *Simon Young,* General Delivery, Mamou, La. 70554.

4,178,874. ROADSIDE EMERGENCY SIGNALLING DEVICE. *Michael S. Berns,* 3N-2335 W. Farwell, Chicago, Ill. 60645.

4,203,175. SLIPPER HOLDER. *Charles A. Heine,* 730 Vera Dr., Arnold, Mo. 63010.

4,205,634. VARIABLE VALVE-TIMING MECHANISM FOR INTERNAL COMBUSTION ENGINES. *E. M. Tourtelot, Jr.,* 2719 Sheridan Rd., Evanston, Ill. 60201.

4,213,069. ELECTRIC MOTOR. Box 596, Ladel, Ill. 61329.

4,242,763. PET TOILET. *John Walker,* 663 Lefferts Ave., Brooklyn, N.Y. 11203.

4,253,698. THEFT GUARD FOR AUTOMOTIVE GASOLINE TANK. *Hollis C. Hodson,* P.O. Box 114, Amo, Ind. 46103.

4,254,700. DOMESTIC APPLIANCE FOR THE LIQUID INJECTION OF MEAT. *Edward H. Fleming.* Correspondence to: Ross, Ross & Flavin, 120 Maple St., Springfield, Mass. 01103.

4,257,186. APPARATUS FOR FLYING TOY AIRPLANE. *William L. Wilson,* 85 Appian Way, Arden, N.C. 28704.

4,262,606. CONVERTIBLE FOLDING TABLES. *Hollis C. Hodson,* P.O. Box 114, Amo, Ind. 46103.

The following Patents, owned jointly by Mobil Oil Corp. and the U.S. Department of the Interior, Bureau of Mines, are offered for licensing to members of the public on a nonexclusive, royalty-free basis. Inquiries and applications for licenses should be addressed to: Office of Patent Counsel, Mobil Oil Corp., 3225 Gallows Rd., Fairfax, Va., 22037.

U.S. Patent No. 4,198,207 DETERMINATION OF WATER CONTENT IN PRESENCE OF OILS.

U.S. Patent No. 4,257,775 DETERMINATION OF WATER CONTENT IN VARIOUS SYSTEMS.

General Electric Co. is prepared to grant non-exclusive licenses under the following patents upon reasonable terms to domestic manufacturers.

Applications for license may be addressed to: Patent Counsel, General Electric Co., Re-Entry Systems Div., 3198 Chestnut St., Philadelphia, Pa. 19101.

3,630,389. MATERIAL-HANDLING APPARATUS.

3,868,296. PLASTIC WALL CONSTRUCTION AS A WALL UNIT.

4,201,831. MAGNETIC ADSORBENT COMPOSITE.

4,216,633. PROCESS AND APPARATUS FOR ELEVATING A FOLDING ROOF SYSTEM.

Applications for license may be addressed to Patent Counsel, Gas Turbine Division, General Electric Co., 1 River Rd., Bldg. 500, Room 218, Schenectady, N.Y. 12345.

4,255,927. COMBUSTION CONTROL SYSTEM.

Applications for license may be addressed to: Patent Counsel, Large Transformer Business Division, General Electric Co., 100 Woodlawn Ave., Pittsfield, Mass. 01201.

3,883,107. LOAD CARRYING BED WITH ADJUSTABLE ANCHOR.

3,883,206. CENTERING AND ANCHORING DEVICE.

3,917,985. TRANSFORMER/TRANSMISSION LINE INTERCONNECT SYSTEM.

4,011,535. VAPORIZATION COOLED TRANSFORMER.

Applications for license may be addressed to: Patent Counsel, Industrial and Marine Steam Turbine Division, General Electric Co., 1100 Western Ave., Lynn, Mass. 01910.

4,208,882. START-UP ATTEMPERATOR.

4,228,959. ROTATING NOZZLE EXPANDER.

4,246,490. ROTATING NOZZLE GENERATOR.

Applications for license under these patents may be addressed to: Mr. Rodney J. Schaid, Director of Administration, American Dental Association, 211 East Chicago Ave., Chicago, Ill. 60611.

4,251,565. POLYFUNCTIONAL SURFACE-ACTIVE COMONOMERS WITH NITROGEN LIGANDS—concerns "adhesives" for resin compositions.

4,243,763. TERTIARY AROMATIC AMINE ACCELERATORS IN ACRYLIC RESIN.

4,217,264. MICROPOROUS GLASSY FILLERS FOR DENTAL RESIN COMPOSITES—concerns fillers prepared by a low temperature gel route.

Application for license may be addressed to the General Electric Co., Division, Patent Counsel, Housewares and Audio Business Division 1285 Boston Ave., Bridgeport, Ct., 06602.

3,737,623. GROUNDED PROBE EJECTOR.

3,747,241. SELF-CLEANING STEAM IRON.

3,749,880. APPARATUS FOR HEATING FLOWABLE MATERIAL.

3,758,969. FAST START SPRAY IRON.

3,777,406. HAIR DRYER.

3,823,498. SELF-CLEANING STEAM IRON.

3,849,916. SELF-CLEANING STEAM IRON.

3,968,740. COFFEEMAKER.

3,986,282. STEAM IRON.

3,919,793. EXTRA CAPACITY STEAM IRON.

4,003,388. HAIR DRYER VARIABLE CONTROL.

4,013,198. MEASURING DISPENSER.

4,013,199. MEASURING DISPENSER.

4,065,705. SCR CONTROLLED UNIVERSAL MOTOR.

4,069,949. APPARATUS FOR HEATING AND DISPENSING FLOWABLE MATERIAL.

4,073,056. VEGETABLE PEELER.

4,088,869. DRYER TEMPERATURE LIMITER.

4,101,729. APPLIANCE STRAIN RELIEF.

4,107,860. STEAM IRON.

4,109,136. THERMOSTAT CONTROLLED FLAT-IRON.

4,132,360. PULSATING HAIR DRYER.

4,149,454. COFFEEMAKER BASKET AND FILTER ASSEMBLY.

4,156,382. BAG SEALER AND CUTTER ASSEMBLY.

4,164,670. SEALED MOTOR MOUNT.

4,180,928. SELF-CLEAN STEAM IRON.

Applications for license may be addressed to the Division Patent Counsel, General Electric Co., Bldg. 2, Room 205, Electronics Park, Syracuse, N.Y. 13221.

3,982,245. SIDELOBE CANCELLER WITH PROGRAMMABLE CORRELATION SIGNAL WEIGHTING.

3,988,686. DIGITALLY CONTROLLED ANALOG FLUX SENSING FERRITE PHASE SHIFTER DRIVER.

4,037,163. AUTOMATIC GAIN CONTROL CIRCUIT.

4,041,442. ACOUSTIC DATA ACQUISITION SYSTEM.

4,044,359. MULTIPLE INTERMEDIATE FREQUENCY SIDE-LOBE CANCELLER.

4,047,172. SIGNAL PROCESSOR FOR PULSE-ECHO SYSTEM PROVIDING INTERFERENCE LEVEL COMPENSATION AND FEED-FORWARD NORMALIZATION.

4,058,160. HEAT TRANSFER DEVICE.

4,063,306. ACTIVELY SWITCHED DAMPING CIRCUIT.

4,074,182. POWER SUPPLY SYSTEM WITH PARALLEL REGULATORS AND KEEP-ALIVE CIRCUITRY.

4,084,257. SIGNAL PROCESSING APPARATUS.

4,099,075. SIGNAL DETECTION APPARATUS USING AN ADAPTIVE THRESHOLD.

4,106,462. IGNITION SYSTEM CONTROL CIRCUIT.

4,125,785. CHARGE TRANSFER MEMORY APPARATUS.

4,125,786. CHARGE TRANSFER MEMORY APPARATUS.

4,132,947. WAVESHAPE DETECTOR.

4,152,280. MOLTEN SALT SYNTHESIS OF MODIFIED LEAD ZIRCONATE TITANATE SOLID SOLUTION POWDER.

4,152,281. MOLTEN SALT SYNTHE IS OF LEAD ZIRCONATE TITANATE SOLID SOLUTION POWDER.

4,161,785. MATRIX MULTIPLIER.

Application for license may be addressed to the General Electric Co., Division Patent Counsel, Housewares and Audio, Business Div., 1285 Boston Ave., Bridgeport, Conn. 06602.

3,423,102. COAXIAL HANDLE ARRANGEMENT.

3,447,189. VACUUM CLEANER WITH CORD REEL.

3,334,370. LIGHTWEIGHT PORTABLE VACUUM CLEANER.

3,251,107. CORD GUIDING AND LOCKING DEVICE FOR UPRIGHT FLOOR APPLIANCE.

3,654,661. VACUUM CLEANER.

3,201,553. APPLIANCE SWITCH AND CONDUCTOR ASSEMBLY.

3,381,328. VACUUM CLEANER INLET COUPLING AND AIR REGULATOR.

3,188,669. RUG CLEANING ATTACHMENT FOR POLISHERS.

3,432,735. IMPROVED SYNCHRONOUR MOTOR.

3,497,782. BATTERY OPERATED CLOCK CIRCUIT.

3,368,231. PORTABLE ELECTRIC CLOTHES CLEANER.

3,608,300. CALENDAR CLOCK.

3,183,738. ADJUSTING SCREW SPRING CLIP.

3,202,799. CONTROL MECHANISM FOR A TOASTER OR SIMILAR APPLIANCE.

3,634,905. ELECTRIC VACUUM CLEANER CONSTRUCTION.

3,618,310. CLOCK TIMER WITH SLEEP SWITCH.

The following patents are offered by: David H. Flynn, Tyler, Cooper, Grant, Bowerman & Keefe. 205 Church St., New Haven, Conn. 06509.

3,984,957. COMPOSITE BUILDING MODULE HAVING A RIGID FOAM CORE ENCASED IN A SHELL MADE OF FIBER REINFORCED CEMENT.

4,084,362. COMPOSITE BUILDING MODULE HAVING A RIGID FOAM CORE ENCASED IN A SHELL MADE OF FIBER REINFORCED CEMENT AND AN ANCHOR DEVICE FOR ATTACHING THE MODULE TO A SUPPORTING STRUCTURE.

4,133,859. A PROCESS AND APPARATUS FOR MAKING A PLURALITY OF BUILDING MODULES, EACH HAVING AN INSULATION FOAM CORE ENCASED IN A SHELL OF FIBER REINFORCED CEMENTITIOUS MATERIAL.

4,229,497. COMPOSITE MODULE HAVING A RIGID FOAM CORE ENCAPSULATED IN A SHELL OF REINFORCED CEMENTITIOUS MATERIAL.

4,069,629. COMPOSITE BUILDING MODULE AND THE PROCESS FOR MAKING SAME AND AT LEAST ONE ANCHOR DEVICE FOR ATTACHING THE MODULE TO EXTERNAL STRUCTURE FOR LIFTING SAME.

4,123,212. A PROCESS AND AN APPARATUS FOR SUBSTANTIALLY UNIFORMLY DISTRIBUTING GLASS FIBERS ONTO A FORMING BED.

4,186,536. COMPOSITE PANEL-LIKE BUILDING MODULE HAVING A RIGID FOAM CORE ENCAPSULATED IN A SHELL AND REINFORCED CEMENTITIOUS MATERIAL HAVING A FACING MEMBER ON ONE MAIN FACE THEREOF, WHICH MAY BE A DRY WALL, AND A PROCESS FOR MAKING THE COMPOSITE MODULE.

4,175,867. A PROCESS AND APPARATUS FOR THE STATIC MIXING OF MATERIALS, PREFERABLY TO PRODUCE GLASS FIBER, REINFORCED CEMENT AND CONCRETE.

4,233,787. A COMPOSITE BUILDING MODULE AND METHOD FOR MAKING SAME, INCLUDING FORMING A BOTTOM LAYER OF FIBER REINFORCED WET CEMENTITIOUS MATERIAL, PLACING AT LEAST TWO RIGID FOAM CORES SIDE BY SIDE ON THE BOTTOM LAYER AND ENCAPSULATING THE CORES IN A FIBER REINFORCED WET CEMENTITIOUS SHELL.

4,252,767. A MONOLITHIC-LIKE, COMPOSITE BUILDING MODULE SUCH AS A WALL PANEL HAVING A CORE OF RIGID FOAM ENCASED IN A SHELL MADE OF FIBER REINFORCED CEMENT.

The RCA Corp. offers to grant nonexclusive licenses on reasonable terms and conditions under the patents listed below. Inquiries respecting licenses under RCA patents should be addressed to RCA Corp., Sr. Vice President, Licensing, 30 Rockefeller Plaza, New York, N.Y. 10020.

4,253,887. METHOD OF DEPOSITING LAYERS OF SEMI-INSULATING GALLIUM ARSENIDE.

4,254,160. METHOD FOR SLURRY COATING A FACEPLATE PANEL HAVING A PERIPHERAL SIDEWALL.

4,254,365. SIDE PINCUSHION CORRECTION MODULATOR CIRCUIT.

4,254,366. REGULATED DEFLECTION CIRCUIT.

4,254,381. BALANCED-TO-SINGLE-ENDED SIGNAL CONVERTERS.

4,254,426. METHOD AND STRUCTURE FOR PASSIVATING SEMICONDUCTOR MATERIAL.

4,254,436. NOISE CANCELLATION CIRCUIT.

4,254,447. INTEGRATED CIRCUIT HEAT DISSIPATOR.

4,254,506. CHANNEL IDENTIFICATION APPARATUS USEFUL IN A MULTIBAND SWEEP TYPE TUNING SYSTEM.

4,255,019. DIFFRACTIVE COLOR FILTER.

4,255,504. METHOD FOR PRODUCING CRT SCREEN STRUCTURE.

4,255,514. METHOD FOR FABRICATING A DIFFRACTIVE SUBTRACTIVE FILTER EMBOSSING MASTER.

4,255,714. GAAS DUAL-GATE FET FREQUENCY DISCRIMINATOR.

4,255,740. SYSTEMS FOR COMPARING AND RANKING A PLURALITY OF SIGNAL INPUTS.

4,255,758. SELF-ADJUSTING BELL FILTER CIRCUIT FOR USE IN SECAM CODERS.

4,256,052. TEMPERATURE GRADIENT MEANS IN REACTOR TUBE OF VAPOR DEPOSITION APPARATUS.

4,256,311. VIDEO DISC STYLUS RETRACTOR.

4,256,796. PARTIALLY DEVITRIFIED PORCELAIN COMPOSITION AND ARTICLES PREPARED WITH SAME.

4,257,009. INHIBIT CIRCUIT FOR A DIFFERENTIAL AMPLIFIER.

4,257,068. SYSTEM FOR PERIODICALLY REVERSING THE ORDER OF VIDEO DATA IN A FLAT PANEL DISPLAY DEVICE.

4,258,233. TRACK SKIPPER APPARATUS FOR VIDEO DISC PLAYER.

4,258,284. ELECTRON TUBE HAVING ELECTRODE CENTERING MEANS.

4,258,383. MINIMUM PRESSURE DROP LIQUID COOLED STRUCTURE FOR A SEMICONDUCTOR DEVICE.

4,258,467. METHOD OF MAKING TRANSFORMER.

4,258,508. FREE HOLD DOWN OF WAFERS FOR MATERIAL REMOVAL.

4,259,166. SHIELD FOR PLATING SUBSTRATE.

4,259,414. NON-AIR POLLUTING, NON-PYROLYTIC UPGRADING OF COAL FOR CLEANER AND MORE EFFECTIVE ELECTRICAL POWER GENERATION.

4,259,421. IMPROVING ETCH-RESISTANCE OF CASEIN-BASED PHOTORESIST PATTERN.

4,259,587. X-RAY LUMINESCENT GLASSES.

4,259,609. PICK-UP TUBE HAVING LIGHT CONTROLLABLE FURCATED LIGHT PIPES.

4,259,611. SEGMENTED SHADOW MASK.

4,259,612. FACEPLATE ASSEMBLY FOR A FLAT PANEL COLOR DISPLAY DEVICE.

4,259,671. ANTENNA DEICING APPARATUS.

4,259,692. PROJECTION KINESCOPE AND METHOD OF OPERATION.

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The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

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	Sacramento: California State Library	(916) 323-4572
	Sunnyvale Patent Library*	(408) 736-0795
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Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
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New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
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	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
	University Park: The Pennsylvania State Libraries	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
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Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF May 2, 1981

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	2-07-80
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-11-79
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	1-07-80
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	3-03-80
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-17-80
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—VACANT ..... Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	11-13-79
SPECIAL LAWS ADMINISTRATION, GROUP 220—VACANT ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	9-17-79
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—VACANT ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	11-14-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	12-07-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-21-78
DESIGN, GROUP 290—C. D. QUARFORTH, Director ..... Industrial Arts; Household, Personal and Fine Arts.	3-26-79
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	12-11-79
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director ... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	12-03-79
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	9-13-79
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	10-05-79
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	3-19-79

Expiration of patents: The patents within the range of numbers indicated below expire during May 1981, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,131,397 to 3,134,980, inclusive

Plant Patents ..... Numbers 2,399 to 2,406, inclusive

REISSUES

JUNE 16, 1981

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,645

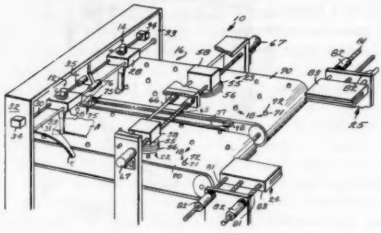
METHOD AND APPARATUS FOR CUTTING SHEET METAL WRAPPERS OR THE LIKE

James H. Stubbings, Rockville, Md., assignor to Potomac Applied Mechanics, Inc., Bethesda, Md.

Original No. 4,070,890, dated Jan. 31, 1978, Ser. No. 648,776, Jan. 13, 1976. Application for reissue Jul. 6, 1979, Ser. No. 55,370

Int. Cl.[3] **B26D** *5/30;* **B21F** *11/00*

U.S. Cl. 72—129 **20 Claims**



14. A method for automatically cutting wrappers or the like from metal sheets utilizing a pair of cutting devices mounted for movement in a given horizontal direction Y, and for movement with respect to each other in the direction Y, the operation, and position in the direction Y, of each of the cutting devices being automatically controlled; said method comprising the steps of

(a) conveying a metal or the like sheet in a given horizontal direction X toward the cutting devices, the direction X being substantially perpendicular to the direction Y;

(b) automatically controlling the operation and position in direction Y of each of the cutting devices to simultaneously form longitudinal edges of a wrapper or the like, at least one of the longitudinal edges being non-parallel to both the directions X and Y; and

(c) automatically conveying the cut wrapper or the like past the cutting devices in the X direction while cutting of the wrapper or the like continues.

Re. 30,646

CEMENT SIDE AND HEEL LASTING MACHINE

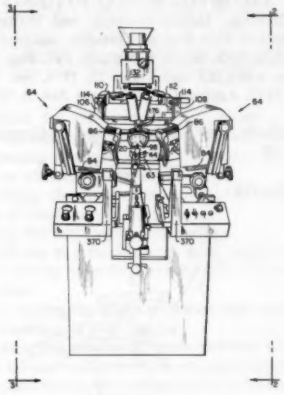
Walter Vornberger, Tewksbury, Mass., and Karl F. Vornberger, Amherst, N.H., assignors to International Shoe Machine Corporation, Nashua, N.H.

Original No. 4,082,060, dated Apr. 4, 1978, Ser. No. 762,685, Jan. 26, 1977. Application for reissue Apr. 2, 1979, Ser. No. 25,695

Int. Cl.[3] **B05C** *3/02, 11/00;* **A43D** *21/00*

U.S. Cl. 118—411 **11 Claims**

1. A machine, operable on a shoe assembly formed of a last having an insole located on its bottom and an upper mounted thereon with the toe portion of the upper margin being wiped against and secured to the insole and unwiped portions of the upper margin extending heelwardly of said wiped upper margin portion, for applying cement in the corners between said unwiped margin portions and the corresponding portions of the insole periphery compising: a shoe assembly support for supporting the shoe assembly bottom-up with the toe end of the shoe assembly facing forwardly; a pair of nozzles, located above the shoe assembly, mounted for forward-rearward movement, for heightwise movement, and for inward-outward movement; a stop member located in a particular location; an engaging member, mounted for forward-rearward movement in unison with the nozzles, located rearwardly of the stop member in intersecting relationship with the stop member; means for initially retaining the nozzles in rearward, upper and inner positions; means for thereafter moving the nozzles, together with the engaging member, forwardly until the engaging member intersects the stop member; means for thereafter effecting lowering and [outboard] *outward* movements of the nozzles to move the nozzles into said corners heelwardly of the boundaries between said wiped and unwiped upper margin portions; means for thereafter removing the stop member from said particular location to enable the nozzles to resume their forward movement so as to bring the nozzles to said boundaries; means operative when the nozzles have arrived at said boundaries to effect rearward movement of the nozzles while maintaining the nozzles in said corners; and means for extruding cement from the nozzles into said corners during said



rearward movements of the nozzles; the machine having the improvement comprising: a detector member mounted for forward-rearward movement; means so mounting the stop member and so connecting the stop member to the detector member as to cause the stop member to have forward-rearward movement in unison with the detector member; means for initially locating the detector member in a forward position that is forward of the toe end extremity of the shoe assembly; and means, operative prior to said first mentioned forward movement of the nozzles, for yieldably moving the detector member, together with the stop member, rearwardly to bring the detector member into engagement with the toe end extremity of the shoe assembly and to thereby bring the stop member to said particular location.

Re. 30,647

TUBULAR CONNECTION

Thomas L. Blose, Houston, Tex., assignor to Hydril Company, Los Angeles, Calif.

Original No. 3,989,284, dated Nov. 2, 1976, Ser. No. 570,633, Apr. 23, 1975. Application for reissue May 31, 1978, Ser. No. 911,117

Int. Cl.[3] **F16L** *15/00*

U.S. Cl. 285—332.2 **61 Claims**

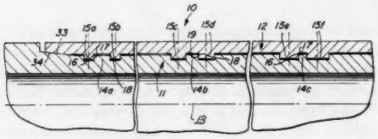
1. In a pipe joint including pin and box members, the joint having an axis,

a. a pair of interengaged threads on said members for producing hoop tension in the pin member and hoop com-

pression in the box member in response to forcible make-up of said members,

b. the threads on said members having dove-tail interfit,

c. said thread on each member having progressively changing axial width along substantially the entire helical length thereof and at selected radical distance from said axis, whereby upon complete make-up of the joint the interengaged thread flanks produce forces tending to urge the members radially together.



Re. 30,648

CHAIR FOR DENTAL PATIENTS

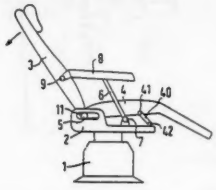
Wilhelm Ohlrogge, Uelzen-Veerssen, and Walter Hetz, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Original No. 3,806,192, dated Apr. 23, 1974, Ser. No. 264,211, Jun. 19, 1972. Application for reissue Jun. 2, 1978, Ser. No. 912,233

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1971, 2141022

Int. Cl.[2] A61G *15/00*

U.S. Cl. 297—318 **13 Claims**



1. A chair for dental patients, comprising a lower portion and an upper portion, said upper portion having a back, a seat, and a hinge connecting the lower end of said back with the rear end of said seat, said upper and lower portions having means for supporting and moving said seat in a longitudinal direction, said means including crosshead [guides] *guide assemblies,* one part of *each of* said crosshead [guides] *guide assemblies* being connected with the seat and the other part with the lower portion, [the chair] *said means* having rods with ends connected about a horizontal axis transverse to the longitudinal axis of the chair with said back and other ends connected with said lower portion, *at least one of the rods providing an arm support for the chair,* and means interposed between said seat and said lower portion and away from said hinge for tipping said seat about a horizontal axis toward said back when said back is inclined.

Re. 30,649

FOOD PROCESSING APPARATUS

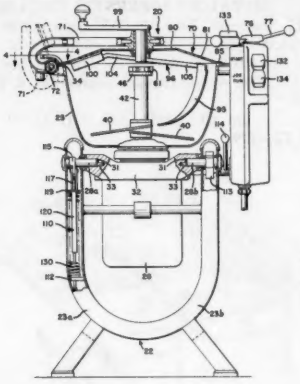
James W. Thompson, Troy, Ohio, assignor to Hobart Corporation, Troy, Ohio

Original No. 4,100,615, dated Jul. 11, 1978, Ser. No. 803,462, Jun. 6, 1977. Application for reissue Nov. 2, 1979, Ser. No. 90,822

Int. Cl.[3] B01F *7/16*

U.S. Cl. 366—169 **4 Claims**

1. In an apparatus for processing foodstuffs, including a mixing bowl having a drive shaft extending into the bowl through the bottom center thereof, a motor mounted outside the bowl and connected to rotate the drive shaft, food processing blades mountable on the drive shaft within the bowl for processing foodstuffs therein when the motor is operated, a cover system including a lid for closing the top of the bowl, and a mixing baffle blade and support mounted through the center of the lid for rotation along and around the inside surface of the bowl for removing and returning foodstuffs from the side of the bowl to the vicinity of the food processing blades for further processing thereby, the improvement comprising means defining a hollow drive shaft for said mixing baffle blade and support connecting through the center of the lid and being open in the top and bottom thereof for introducing liquids into the mixing bowl directly over the food processing blades and drive shaft while the motor is being operated.



Re. 30,650

DISPERSING AND STABILIZING AGENTS FOR DYESTUFFS

Reinhold Deubel; Helmut Diery; Wolfgang Klinner; Karl-Hermann List, and Heinz Uhrig, all of Frankfurt, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Original No. 3,781,169, dated Dec. 25, 1973, Ser. No. 907,785, May 19, 1978. Continuation of Ser. No. 907,785, May 19, 1978, abandoned. Application for reissue Dec. 14, 1979, Ser. No. 103,492

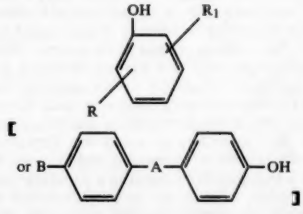
Int. Cl.[3] D06P *1/22;* C09B *67/00*

U.S. Cl. 8—560 **2 Claims**

1. A dyestuff dispersion consisting essentially of:

(a) 1 part by weight of a disperse- or vat-dyestuff; and

(b) 0.2 to 3 parts by weight of a dispersing agent formed by co-condensation of 1 mol of a phenolic component, 1.1 to 4 mols of formaldehyde and 0.3 to 1.6 mols of alkali metal sulfite, said phenolic component being [selected from the group consisting of] *of the formula*



wherein R is hydrogen, chlorine or lower alkyl, *and* R_1 is

hydrogen[,] *or* alkyl with one to 12 carbon atoms[, B is hydrogen or hydroxyl and A is a single bond, sulfonyl or alkylene with one to four carbon atoms].

Re. 30,651

PROCESS FOR PRODUCING A ROASTED PEANUT PRODUCT

William M. Green, Robersonville, N.C., assignor to Carolina Peanuts of Robersonville, Inc., Robersonville, N.C.

Original No. 4,085,230, dated Apr. 18, 1978, Ser. No. 448,666, Mar. 6, 1974. Application for reissue Feb. 11, 1980, Ser. No. 120,761

Int. Cl.³ A23L *1/36*

U.S. Cl. 426—262 **8 Claims**

1. The process of preparing a roasted peanut product comprising: removing the shells and skins from raw peanuts; precooking said peanuts over a period of from about 4 to 12 minutes in a water solution which contains from between about 0.02 to 1.0 percent by weight of a reducing sugar and wherein said water solution is maintained at a temperature in the range of from about 190° to 212° F. throughout said precooking operation; removing said peanuts from said hot precooking cooking solution and eliminating excess water from the exterior of such peanuts; roasting said peanuts in a bath of hot edible oil for a period of 3 to 8 minutes at a temperature ranging from 320° to 380° Fahrenheit; removing said roasted peanuts from said oil bath and draining excess oil therefrom; cooling said peanuts to approximate ambient temperature; coating said peanuts with a liquid edible oil or fat ranging from 1 to 3 percent by weight of the peanuts; salting said peanuts to impart a favorable flavor thereto; and packaging said peanuts whereby a superior roasted peanut product is produced.

8. The process of preparing a roasted peanut product comprising: removing the shells and skins from raw peanuts; precooking said peanuts over a period of from about 4 to 12 minutes in a water solution maintained at a temperature in the range of from about 190° to 212° F. throughout said precooking operation; removing said peanuts from said hot precooking cooking solution and eliminating excess water from the exterior of such peanuts; roasting said peanuts in a bath of hot edible oil for a period of 3 to 8 minutes at a temperature ranging from 320° to 380° Fahrenheit; removing said roasted peanuts from said oil bath and draining excess oil therefrom; cooling said peanuts to approximate ambient temperature; coating said peanuts with a liquid edible oil or fat ranging from 1 to 3 percent by weight of the peanuts; salting said peanuts to impart a favorable flavor thereto; and packaging said peanuts whereby a superior roasted peanut product is produced.

Re. 30,652

METHOD FOR CONSTRUCTING A THERMOELECTRIC MODULE AND THE MODULE SO OBTAINED

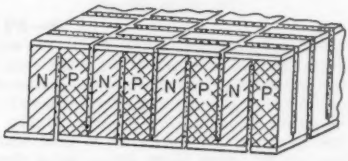
Giovanni Germano; Francesco Losciale, both of Rome; Roberto Falesiedi, Piansano; Ferruccio Daclon, Grottaferrat, and Nicola Merzagora, Rome, all of Italy, assignors to Snamprogetti S.p.A., Milan, Italy

Original No. 4,081,895, dated Apr. 4, 1978, Ser. No. 724,544, Sep. 20, 1976. Application for reissue Dec. 13, 1978, Ser. No. 968,920

Claims priority, application Italy, Sep. 30, 1975, 27777 A/75

Int. Cl.² H01L *23/56*

U.S. Cl. 357—28 **3 Claims**



1. A method for constructing a thermoelectric module, comprising the following operations:

(a) constructing a reference shoulder on the semiconductor bar by an ultrasonic perforator;

(b) assembling the semiconductor bars in series, using a cement of insulating properties;

(c) cleaning the surfaces by sandblasting;

(d) gold plating to a thickness of 1μ by metalisation;

(e) nickel plating to a thickness of 0.01–0.03 mm using a Watts bath;

(f) brasing copper electrodes under vacuum using a welding alloy consisting of Au, Ag, Ga;

(g) machining the regions between elements which have to remain isolated using an ultrasonic perforator;

(h) protecting the copper electrodes by nickel or chromium plating.

3. The method in accordance with claim 1 wherein the welding alloy consists essentially of 50% Au, 20% Ag and 30% Ga.

PLANT PATENTS

GRANTED JUNE 16, 1981

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,741
GRANNY SMITH APPLE TREE (GREENSPUR STRAIN)

Calvin L. Cooper, Brewster, Wash., assignor to Auvil Fruit Co., Inc., Orondo, Wash., a part interest

Filed Apr. 18, 1980, Ser. No. 141,310
Int. Cl.[3] A01H *5/03*
U.S. Cl. Plt.—34 **1 Claim**

1. A new and distinct variety of Granny Smith apple tree similar to the parent Hannaford strain Granny Smith apple tree, but characterized by significantly increased bloom set, by significantly higher setting of double and triple apple clusters, by sharply increased productivity, and by materially reduced internodal distances on the terminal growths of its branches.

4,742
BEGONIA PLANT

Cornelis P. Van den Berg, Ashtabula, Ohio, assignor to Mikkelsens Inc., Ashtabula, Ohio

Filed Mar. 20, 1980, Ser. No. 132,328
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of begonia plant known by the cultivar name Harmony, as described and illustrated, and particularly characterized as to uniqueness by its large, double, light orange flowers and dark green foliage; relatively great number of pistillated flowers; early flowering and floriferous habit; excellent keeping quality; adaptability in a controlled environment to year round flowering and varying pot size; sturdy, upright and compact growth habits, and by its excellent vigor.

4,743
BEGONIA PLANT

James C. Mikkelsen, and Cornelis P. van den Berg, both of Ashtabula, Ohio, assignors to Mikkelsens Inc., Ashtabula, Ohio

Filed Mar. 25, 1980, Ser. No. 133,901
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of begonia plant known by the cultivar name Ballet, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of clear yellow flowers and dark green foliage; double flowers, with the tepals in the center being smaller and more ruffled than those of the parent cultivar Baluga, and by its significantly larger outside tepals, giving the impression of a flower having a relatively small center enframed by the two outside tepals.

4,744
KALANCHOE NAMED PUEBLO

Claude Hope, Cartago, Costa Rica, assignor to Pan-American Plant Company, West Chicago, Ill.

Filed May 16, 1980, Ser. No. 150,590
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of kalanchoe plant, substantially as herein shown and described, characterized by its orange-yellow flowers displayed in panicles supported by rigid stems and clustered above and between dark green shiny leaves, the plant having a strong, vigorous and rapid growth habit and a profuse production of flowers.

4,745
KALANCHOE NAMED YUCATAN

Claude Hope, Cartago, Costa Rica, assignor to Pan-American Plant Company, West Chicago, Ill.

Filed May 16, 1980, Ser. No. 150,591
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct kalanchoe cultivar, substantially as herein shown and described, characterized in particular by its massed profuse production of small flowers which are of a light red color upon first opening but soon turning to a bright pink.

PATENTS

GRANTED JUN. 16, 1981

ERRATA

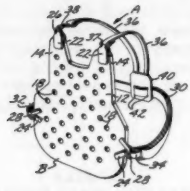
For CLASS	See PATENT NO.
434–340	4,272,896
074–711	4,272,993
081–177 M	4,273,173
411–168	4,273,175
294–087.2	4,273,273
294–141	4,273,274
493–427	4,273,320
369–032	4,273,342
518–715	4,273,724
369–126	4,273,967
033–296	4,274,061

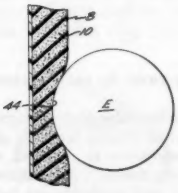
PATENTS

GRANTED JUNE 16, 1981

GENERAL AND MECHANICAL

4,272,847
BASEBALL PLAYER'S CHEST PROTECTOR
William J. Buhler, 2210 McNab Ave., Long Beach, Calif. 90815
Filed Apr. 30, 1979, Ser. No. 34,650
Int. Cl.³ A41D *13/00*
U.S. Cl. 2—2 **6 Claims**





1. A lightweight, perspiration impervious baseball catcher's chest protector that causes a thrown baseball striking the same to drop to the ground adjacent the catcher and said protector allowing flow of air from the ambient atmosphere to the catcher's body, said chest protector of the type that includes a protective pad that extends across at least the chest of the catcher and a harness that removably supports said pad on said catcher, with said pad being characterized by being formed from a sheet of a foamed resilient organic material that has a section thereof deform transversely and laterally into a concavity when struck by a thrown baseball, with the major portion of the kinetic energy of said baseball being dissipated in laterally deforming said sheet, and said material having a sufficiently slow rate of recovery to its initial configuration that said baseball does not tend to bounce therefrom but instead drops to the ground adjacent said catcher, and a plurality of spaced transverse openings in said sheet through which air from the ambient atmosphere may circulate to the cather's body adjacent said pad; and

a film of a pliable polymerized water impervious, abrasion resistant resin that covers said sheet on the side adjacent the body of said catcher to prevent said sheet from absorbing perspiration from said catcher.

4,272,848
MOISTURE-RELIEVING GARMENT
Shirley B. Hoofnagle, 309 Wessling Cir., Catonsville, Md. 21228
Filed May 14, 1979, Ser. No. 38,888
Int. Cl.³ A41D *13/00;* **A41B** *9/06*
U.S. Cl. 2—2 **5 Claims**

1. An undergarment to be worn by an individual between a body or limb portion of the individual and a surrounding enclosure such as an orthopedic device for removal of moisture, which comprises:

a first single layer of fabric;

a second single layer of fabric;

each fabric being formed entirely by a plurality of randomly arrayed spunlaced polyester fibers;

each fiber of each respective fabric being entangled with other fibers of the respective fabric and free to move independently of any other fiber of the respective fabric;

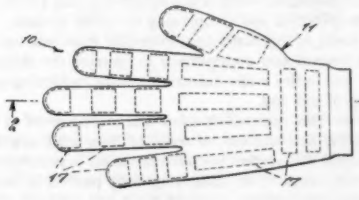
at least some of the fibers of each fabric having end portions which extend outwardly from one surface of the fabric to form an unsmooth surface;

the first layer of fabric placed in interfacing relation with the second layer of fabric to form a double-layer fabric arrangement having unsmooth outer surfaces;

the double-layer fabric arrangement being formed in a generally cylindrical shape to fit about a selected area of the body or limb portion of the individual which area is to be encompassed by the surrounding enclosure; and

the cylindrical shape of the double-layer fabric arrangement having opposite end edges and inner and outer surfaces formed by the unsmooth surfaces of the double-layer fabric arrangement with the inner unsmooth surface adjacent to the body or limb portion of the individual and the outer unsmooth surface adjacent to the inner surface of the surrounding enclosure when the undergarment and enclosure are worn by the individual whereby the end portions of said fibers in said unsmooth surface adjacent said body contact the moisture droplets on the wearers body and the moisture is wicked away.

4,272,849
FLEXIBLE FORM FITTING GLOVE
Jay D. Thurston, c/o George Spector, 3615 Woolworth Building, 233 Broadway, and George Spector, 3615 Woolworth Building, 233 Broadway, both of New York, N.Y. 10007
Filed Dec. 28, 1978, Ser. No. 973,866
Int. Cl.³ A41D *19/00*
U.S. Cl. 2—16 **2 Claims**



1. A flexible, form fitting glove, comprising in combination a flexible glove member including a hand portion and fingers being made of an outer and an inner liner, said cover and liner being made of flexible materials, a space between said cover and liner having a plurably of steel plates so positioned to not interfere with front movements of a wearer, said plate being placed on a back hand side of said glove and located over non-jointed portions of said fingers and hands, wherein each

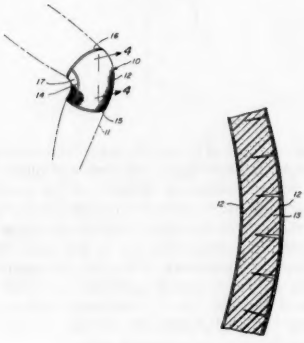
said plate includes a lug on each opposite side to wrap around opposite sides of said fingers wherein said plates are pivotally attached together by hinges including a tab on one end of each plate which overlaps an opposite end of each adjacent plate to limit backward pivotal movement of each plate.

4,272,850

BODY PROTECTIVE PADS

Robert J. Rule, Manhasset, N.Y., assignor to W. H. Brine Company, Milford, Mass.

Filed May 25, 1979, Ser. No. 42,582
Int. Cl.[3] A41D *13/06*
U.S. Cl. 2—24 **6 Claims**



1. A protective pad for use in cushioning and protecting the body,

said pad comprising a resilient organic polymeric foam material having body cushioning properties and a predetermined thickness,

said pad having an undersurface designed to face a body area to be protected and an opposing top outer surface,

and a series of thin score lines extending from said top surface toward said undersurface to increase the ability of said pad to flex while maintaining body cushioning properties of said pad,

said score lines comprising a first and second series of lines with the first and second series of lines being angularly arranged with respect to each other to aid in accommodating movement of an underlying body portion in various planes,

said score lines having a depth of at least about 25% of the thickness of said pad,

said score lines permitting spreading of the top surface of said pad when said pad is flexed so that normally facing walls of the indentations formed by the score lines move apart to define a flexed opening therebetween without said opening exceeding a distance that is greater than the distance of objects likely to engage and strike the pad.

4,272,851

HAZARDOUS ENVIRONMENT SUIT

Lynn E. Goldstein, Cleburne, Tex., assignor to Durafab Division of Texel Industries, Inc., Cleburne, Tex.

Filed Feb. 16, 1979, Ser. No. 12,655
Int. Cl.[3] A41D *13/02*
U.S. Cl. 2—79 **4 Claims**

1. A protective garment for use in contaminated areas, comprising:

a. laminated seam-bondable body material, said seam-bondable body material forming the body of said garment and comprising non-woven spunbonded olefin having laminated to one side thereof a polyethylene film,

b. bonded seams, said bonded seams being formed of said seam-bondable body material and comprising an ultrasonically induced welded seam portion,

c. binding means on the outside of said bonded seams, said binding means comprising a sewn binding sewn externally of said bonded seam, the stitching of said sewn binding being positioned such that said welded seam portion is located between said stitching and the interior of said garment, and

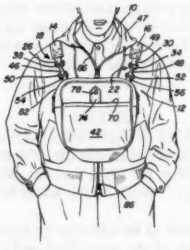
d. double zipper means securing a body opening in said garment.

4,272,852

GARMENT WITH SHOULDER ATTACHED SUPPORTING STRAPS

Richard S. Bell, Gloucester, Mass., assignor to Mighty-Mac, Inc., Gloucester, Mass.

Filed Apr. 28, 1978, Ser. No. 901,308
Int. Cl.[3] A41D *1/00*; A45C *1/04*
U.S. Cl. 2—94 **8 Claims**



1. An outer garment having attaching means affixed to the outside thereof for removably securing an attachable knapsack at an outside location on the garment selectable from the front of said garment and the rear of said garment, the garment having front closure means and shoulders, said attaching means comprising a pair of shoulder straps extending over the

respective shoulders of said garment from the front to the rear of said garment, said straps being sewn to the outside of said garment substantially along the entire length of said straps, each of said straps containing a free end, said free end comprising a cloth loop passing through a ring, said ring capable of removably securing said attachable knapsack, said cloth loop being affixed to said strap by stitching the length of said straps containing the respective free ends extending from the top of the shoulder area of said garment to an area of said garment just below the top of the chest at the front of the wearer and to the shoulder blade area at the back of the wearer, whereby the placement of the free ends at the front of the garment allows a knapsack to be positioned above the waist and supported against the chest of the wearer and the placement of the free ends at the rear of the garment allows a knapsack to be positioned above the waist and supported on the back of the wearer, the attaching means producing both a decorative and a functional effect.

4,272,853

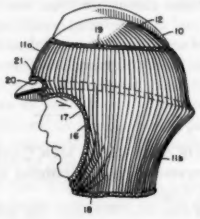
COLD WEATHER HOOD FOR SAFETY HAT

Walter E. Schuessler, 800 Redbud La., Wilmette, Ill. 60091

Filed Dec. 31, 1979, Ser. No. 108,518

Int. Cl.³ A42B *1/04, 3/00*

U.S. Cl. 2—424 **24 Claims**



1. A protective hood for use with a safety hat having rigid integral crown and brim portions, said hood comprising a tube of stretchable knitted fabric having upper and lower portions and having a maximum diameter in an unstretched state substantially smaller than the brim of a safety hat to be worn therewith, said tube being open at its lower end and having at least one face opening located in said lower portion, said tube also having at least one brim-receiving slit between said upper and lower portions for receiving a portion of the brim of a safety hat to anchor said tube against longitudinal and lateral sliding movement relative to a safety hat over which said upper portion of said tube is fitted, said slit and face opening being spaced apart to define a lateral band of fabric therebetween for protecting a wearer's forehead and for restraining upward movement of said hood upon a safety hat.

4,272,854

BI-LEAFLET HEART VALVE

Jack C. Bokros, Alpine, Calif., assignor to Carbomedics, Inc., Austin, Tex.

Filed Aug. 7, 1979, Ser. No. 64,400

Int. Cl.³ A61F *1/22*

U.S. Cl. 3—1.5 **6 Claims**

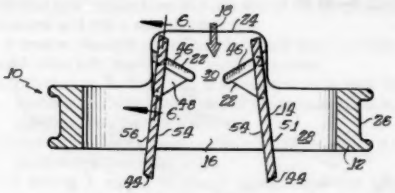
1. A heart valve prosthesis comprising

an annular valve body having a central passageway therethrough,

a pair of leaflets which are proportioned to jointly close said passageway, and

means mounting said leaflets for substantially pivotal movement between a closed position blocking blood flow through said central passageway and an open position allowing blood flow therethrough,

said mounting means including projections extending in opposite directions from the lateral sides of each of said leaflets and generally diametrically opposed slots in said annular valve body wherein each of said projections is respectively disposed, each of said slots extending along a substantially straight line displaced from a plane perpendicular to the centerline of said passageway by an angle of between about 20° and about 40° in a direction outward from the center and upstream of blood flow,



said projections having rounded ends and said slots being open at the outward end thereof and curved at the other end with a radius of curvature proportioned to the curvature of said rounded ends, whereby said slots guide the pivotal movement of said leaflets by defining the path along with said projections can travel during opening and closing movement.

4,272,855

ANCHORING SURFACE FOR A BONE IMPLANT

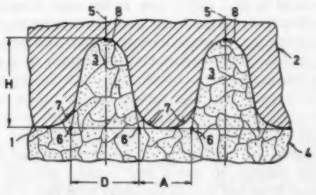
Otto Frey, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed May 10, 1979, Ser. No. 37,752

Claims priority, application Switzerland, May 19, 1978, 5443/78

Int. Cl.³ A61F *1/03*

U.S. Cl. 3—1.9 **12 Claims**



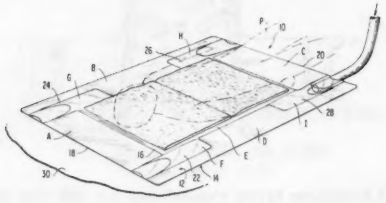
1. A bone implant having an anchoring surface including a plurality of villi, each said villus having a generally conical shape devoid of corners and edges and a longitudinal axis extending from a base level of said surface at an angle of from 50° to 90°, each said villus having a transition surface merging into said base level of said anchoring surface without corners and edges, each said villus having a cross-section in a transverse plane at said base level with a transverse width D and a longitudinal length L in the range $D \leqq L \leqq 3$ D, a height H from said base level in the range $1D \leqq H \leqq 5$ D, and with a spacing A between the generatrices of the conical shape of adjacent villi in said transverse plane in the range $0.25 D \leqq A \leqq 1D$.

4,272,856

DISPOSABLE AIR-BEARING PATIENT MOVER AND A VALVE EMPLOYED THEREIN

Jack Wegener, 830 Chambers Ave., Gloucester City, N.J., and Raynor A. Johnson, Newark, Del., assignors to Jack Wegener, Gloucester City, N.J.

Filed Aug. 28, 1979, Ser. No. 70,464
Int. Cl.[3] A47C *27/08;* B63C *7/10*
U.S. Cl. 5—81 R 9 Claims



1. A low-cost, disposable patient mover of the air-bearing type for minimal friction movement of a medical patient supported by a generally rigid planar backing member over an underlying generally planar fixed support surface, said patient mover including top and bottom walls at least partially defining a plenum chamber, at least said bottom wall being formed of thin flexible material, said bottom wall including a portion bearing small diameter perforations with the perforations opening into the plenum chamber, air dispersion means carried by the patient mover for insuring airflow thorughout the chamber when the patient mover is under load at the time of air pressurization of the plenum chamber, means for controlling pillowing of the flexible material to permit jacking of the backing member and the medical patient sufficient to permit the patient mover to accommodate surface irregularities for both the load support surface and the backing member while preventing ballooning of the flexible material, air inlet means provided to the chamber for permitting air pressurization of the chamber for jacking the load and for subsequent discharge through said perforations to create an air film between the bottom wall and the fixed support surface, said air inlet means comprising at least one outer tube formed of thin flexible material and an inner tube mounted coaxially within the outer tube and comprised of opposed, flexible tongues having a flexibility less than that of the thin flexible material forming said outer tube and being sealed on the outer surface of opposed inner tube portions to said outer tube at the ends remote from the plenum chamber and with the ends proximate to the plenum chamber being free of each other and from said outer tube, and wherein said tongues have an elastic memory such that during air entry into the plenum chamber through the inner and outer tubes, the tongues take the curved configuration of the outer tube and are separated from each other and in contact with said outer tube end, subsequently, after pressurization of the plenum chamber, air tending to escape through said inlet means causes the tongues to move into sealing contact with each other, away from one side of the outer tube and to press against the other side of the outer tube to thereby close off said inlet means.

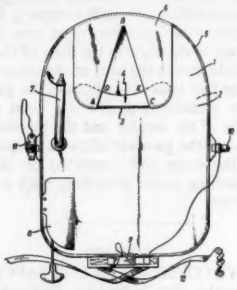
4,272,857

LIFEJACKET

Walter Oldham, Rochdale, England, assignor to Beaufort Air-Sea Equipment Ltd., Birkenhead, England

Filed Jun. 30, 1978, Ser. No. 920,968
Claims priority, application United Kingdom, Sep. 1, 1977, 36454/77
Int. Cl.[3] B63C *9/08*
U.S. Cl. 9—345 11 Claims

1. An inflatable lifejacket comprising a body defining an aperture adapted to receive the wearer's head and defining an upper head portion positioned behind a users head and a chest portion positioned immediately below said aperture, means for inflating the lifejacket and restraint means in the form of sheet material connected to the body of the lifejacket and extending over a portion of the aperture between said head portion and at least one side of said chest portion wherein said restraint means are dimensioned such that, in the deflated condition of the lifejacket, the restraint means are loose and the wearer may don the lifejacket, and in the inflated condition of the lifejacket the sheet material is tensioned to be stretched over the aperture to inhibit the wearer's head slipping back through the aperture.

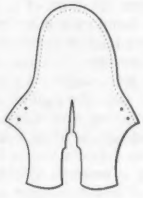


4,272,858

METHOD OF MAKING A MOCCASIN SHOE

John Hlustik, Brentwood, England, assignor to K. Shoemakers Limited, Kendal, England

Filed Jan. 23, 1979, Ser. No. 5,680
Claims priority, application United Kingdom, Jan. 26, 1978, 3227/78
Int. Cl.[3] A43D *9/00;* A43B *3/14;* A43C *13/08*
U.S. Cl. 12—142 MC 11 Claims



1. A method of making a moccasin shoe comprising, in sequence, the following:

cutting parts of an upper including a vamp;

preparing the underside of the vamp for bonding;

assembling the back part of the shoe;

mounting the thus formed and prepared upper on a last;

placing and fixing the mounted upper in a mould;

successively injecting layers of polyurethane or other suitable thermoplastic material having different physical properties into the mould to form a sole bonded to the underside of the upper and also, by means of an upstanding peripheral flange having an external peripheral groove formed therein, to the side margins of the upper;

removing the upper and sole assembly from the mould;

sinking stitching through the groove into the upper to thereby attach the sole to the upper; and

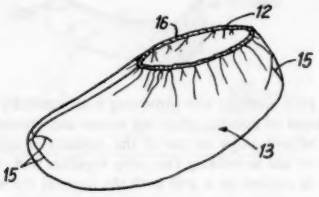
stitching a plug portion to the upper margin of the vamp.

4,272,859

METHOD FOR MANUFACTURING OVERSHOES MADE OF NON-WOVEN FABRIC

Jacques Vanhove, Romilly sur Seine, France, assignor to Mutexil, France

Filed Nov. 7, 1979, Ser. No. 92,083
Claims priority, application France, Nov. 20, 1978, 78 32636
Int. Cl.[3] A43D 9/00; A43B 3/16
U.S. Cl. 12—142 K 6 Claims



1. A method for forming a blank of non-woven fabric suitable for making an overshoe, comprising the steps of:

forming a tube of non-woven fabric, said tube comprising two flat longitudinal faces connected to each other by two lateral gussets each of which is adapted to form the sole of an overshoe,

forming a plurality of spaced transverse lines of join in said tube, said lines of join being oblique with respect to the axis of said tube and joining said longitudinal faces and the opposite faces of said gussets, consecutive lines of join defining a diamond or double-walled parallelogram,

separating said diamonds or double-walled parallelograms along said lines of join, and

cutting each of said diamonds along a median longitudinal line of cut to obtain two blanks having an opening created by said line of cut.

4,272,860

DRAIN AUGER CONTROLLING TOOL

John R. Hinton, W340 N8121 Town Line Rd., Oconomowoc, Wis. 53066

Filed Feb. 15, 1980, Ser. No. 121,828
Int. Cl.[3] B08G 9/06
U.S. Cl. 15—257 R 5 Claims

1. A tool for flexing a front end portion of an elongated, slender, substantially springy drain auger in a desired direction while the auger is in a duct system so that the auger can be caused to advance into a desired part of that system, said tool comprising:

A. a substantially rigid elongated body member;

B. guide means on a front end of said body member defining a reaction surface that has a substantially arcuate curve about an axis transverse to the length of the body member, said surface being engageable by a medial portion of an auger while a more rearward portion of the auger extends along said body member, substantially parallel thereto and at one side thereof;

C. an auger flexing hook member having a connection with the body member to be swingable substantially about said axis and having an auger engaging portion which is spaced radially outwardly from said reaction surface and by which lateral force can be exerted upon a part of an auger that is forward of its said medial portion, to flex the auger around said surface from said one side of the body member toward said other side thereof; and

D. a tension member extending along said body member at said other side thereof, said tension member

(1) having at its front end a connection with said hook member that is spaced from said connection of the hook member with the body member,

(2) having actuating means at its rear end by which it can be drawn rearwardly, and

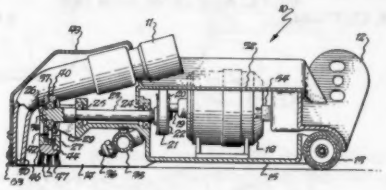
(3) having a supple front end portion that can extend around said reaction surface and react thereagainst to translate rearward movement of the tension member into swinging of the hook member from a position at said one side of the body member towards said other side thereof.

4,272,861

CARPET CLEANING DEVICE

Adolf Notta, and Ian A. Scovell, both of Youngstown, N.Y., assignors to Wetrok, Inc., Niagara Falls, N.Y.

Filed Sep. 28, 1979, Ser. No. 79,960
Int. Cl.[3] A47L 11/12, 11/202
U.S. Cl. 15—320 10 Claims



1. In a carpet cleaning device having means to deliver a liquid cleaning or rinse solution to the carpet, suction pickup means to remove liquid from the carpet and oscillating brush means arranged to contact the carpet, the improvement comprising:

a drive shaft, means to rotate said shaft, means for converting rotation of said shaft to oscillation of said brush means including a crank portion of said shaft disposed at an oblique angle to the axis of said shaft, a bearing mounted on said crank portion, and means connecting said bearing to said brush means, said brush means comprising a transversely extending bar pivoted to oscillate in contact with the carpet, the pivot axis of said brush means, the center line of said bearing and the axis of said shaft substantially intersecting at a common point.

4,272,862

SKINNING APPARATUS

Dennis B. Griffin, Edgewood, and Obie L. Fardo, Butler, both of Ky., assignors to Jay Gee Manufacturing Company, Butler, Ky.

Filed Oct. 1, 1979, Ser. No. 80,245
Int. Cl.[3] A22C 17/12
U.S. Cl. 17—21 18 Claims

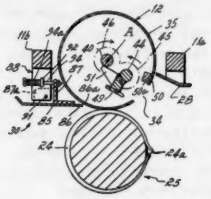
1. Apparatus for skinning hogs, including a rotatable drum, a skin clamp means operatively associated with said drum, and a skinning blade, said drum mounted on a rotatable drive shaft operatively connected with said skin clamp means for driving

said drum through said skin clamp means, the improvement wherein said apparatus further includes;

an end plate fixed at one end of said drum,

an adjustable brake means mounted on said end plate of said drum, said adjustable brake means including,

brake plate means,



a spring-loaded pressure plate means for biasing said brake plate means against and into frictional engagement with said end plate, said brake plate means disposed between said end plate and said pressure plate means, and

means for holding said brake plate stationary against rotation when said drum is rotated, for braking said drum.

4,272,863

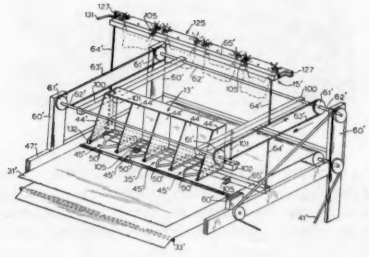
SHACKLING APPARATUS FOR LIVE POULTRY

Alonzo E. Parker, Jr., 1031 S. Plum St., Durham, N.C. 27701

Division of Ser. No. 912,726, Jun. 5, 1978, Pat. No. 4,215,654. This application Apr. 21, 1980, Ser. No. 142,083

Int. Cl.³ A22C *21/00*; A22B *1/00*

U.S. Cl. 17—44.1 **8 Claims**



1. Shackling apparatus adapted for shackling and handling live poultry on foot comprising, in combination:

(a) an elongate base frame structure adapted to be supported in the path of and loaded with a plurality of live fowl on foot and when loaded with a plurality of said fowl adapted to be releasably supported on a processing conveyor; and

(b) laterally-spaced releasable limb securing means mounted on and extending outwardly from said base frame structure for receiving plural pairs of fowl limbs and having movable limb-holding portions adapted to open to receive and to thereafter close and releasably secure selected plural laterally-spaced paired limb portions of the fowl while on foot and in a side-by-side array adjacent said base frame structure.

4,272,864

METHOD FOR MAKING FOOD PATTY

Harry H. Holly, 150 Key Palm Rd., Boca Raton, Fla. 33432

Filed Mar. 29, 1979, Ser. No. 25,031

Int. Cl.³ A22C *7/00*

U.S. Cl. 17—45 **15 Claims**

1. A method for forming a patty of plastic food material, including ground meat and the like, which is subject to shrinkage during cooking, said method comprising the steps of:

(a) forming said material into a plurality of plugs having generally oppositely extending ends; and

(b) assembling said plugs into a closely packed array to define a patty without substantially inwardly compressing

each plug laterally and providing a substantially continuous layer of material disposed across and connecting the ends of said plugs on one of the surfaces of said formed patty to aid in holding the patty together and, when the patty is cooked on a grill with the layer at the top of the patty, to aid in retaining vapors and juices within the patty to thereby promote more rapid cooking.

4,272,865

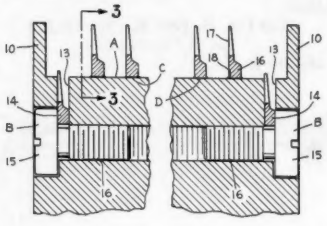
METHOD OF MAKING A BEATER ROLL

Karl H. Schmolke, Zwerenberg, Fed. Rep. of Germany, assignor to John D. Hollingsworth on Wheels, Inc., Greenville, S.C.

Division of Ser. No. 918,484, Jun. 23, 1978, Pat. No. 4,208,767. This application Mar. 29, 1979, Ser. No. 25,030

Int. Cl.³ D01G *15/14*

U.S. Cl. 19—97 **1 Claim**



1. The method of making a surface wound beater roll for use in open end spinning including the steps of:

winding metallic card clothing about a uniform cylindrical beater roll body in spaced helical convolutions, said wire having a base and teeth extending upwardly therefrom, while placing a set therein causing the wire to conform generally to the surface of the beater roll body;

forming repetitive spaces under said teeth by reason of placing said set in said wire, a segment being formed in an underside of said base under each tooth defining said spaces;

applying a liquid sealant upon the wound roll causing the sealant to flow into said spaces; and

allowing the sealant to cure forming a meniscus extending between said cylindrical surface and said base entirely along each side thereof.

4,272,866

WEB GUIDING DEVICE FOR A CARDING MACHINE

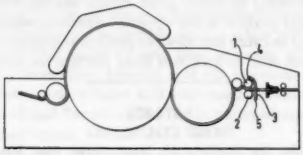
Ulrich Vollrath, Neuss, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. KG, Monchen-Gladbach, Fed. Rep. of Germany

Filed Oct. 10, 1979, Ser. No. 83,560

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1978, 2846137

Int. Cl.[3] D01G *15/46*

U.S. Cl. 19—150 6 Claims



1. In a carding machine having a web delivering assembly including cooperating upper and lower rollers; a web guiding device for withdrawing and gathering a fiber web discharged by the web delivering assembly; the web guiding device including a guide element arranged immediately downstream of the rollers as viewed in the direction of advance of the fiber web; the guide element having at least one operationally stationary guide face extending transversely to the plane in which the fiber web advances; the guide element further having an upper longitudinal edge extending along the upper roller in the immediate vicinity thereof; the improvement wherein said guide element has a lower longitudinal edge extending along said lower roller at a sufficient distance therefrom for allowing waste to drop out downwardly from the fiber web as it passes from said rollers to said guide element.

4,272,867

APPARATUS FOR LOADING A ROPE-LIKE STRAND OF FIBERS INTO SPINNING CANS

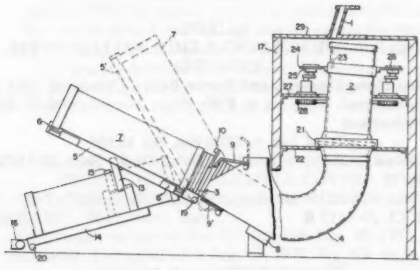
Alf Schopper, Meyrin, Switzerland, assignor to Heberlein Hispano S.A., Switzerland

Filed Oct. 29, 1979, Ser. No. 88,814

Claims priority, application Switzerland, Oct. 30, 1978, 11190/78

Int. Cl.[3] B65H *54/80*

U.S. Cl. 19—159 R 7 Claims



1. An apparatus for loading a rope-like strand of fibers into spinning cans after leaving a card or drawing frame and being piled in cycloidal loops in a tubular member, the improvement comprising a ramp for receiving said rope-like strand and oriented such that the strand is slideable through the ramp to a discharge end thereof, a can support located adjacent the discharge end of said ramp for releasably supporting a can with an open end positioned to receive the rope-like strand from the discharge end of said ramp, means for tilting said can support about a tilt axis located adjacent the discharge end of said ramp to a number of positions at angles to the horizontal such that the can supported thereon can be progressively oriented at different angles in a vertical plane prior to, during and after filling, and means for severing the rope-like strand between the discharge end of said ramp and the open end of said can.

4,272,868

DEVICE FOR OBTAINING A CONTROL SIGNAL CORRESPONDING TO THE DENSITY OF THE FIBRE WEB LYING ON A FIBRE-CARRYING ELEMENT OF A CARD

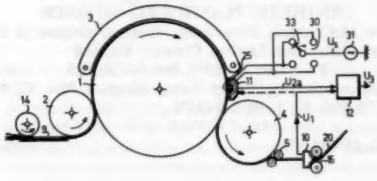
Werner Grunder, Mönchaltorf, and Ernst Loch, Uster, both of Switzerland, assignors to Zellweger Uster, Ltd., Uster, Switzerland

Filed Apr. 26, 1979, Ser. No. 33,448

Claims priority, application Switzerland, Apr. 26, 1978, 4496/78

Int. Cl.[3] D01H *5/38*

U.S. Cl. 19—240 28 Claims



1. A device for obtaining a control signal corresponding to the density of the fibre covering lying on a fibre carrying element of a card, comprising:

a holder which extends over the width of the fibre carrying element to span the width of the fibre covering on said fibre carrying element; and

means mounted on said holder responsive to the density of the fibre covering lying on the fibre carrying element for producing output signals corresponding to the density of the fibre covering.

4,272,869

UNITIZED ATTACHMENT DEVICE

Nancy J. Willner, 186 The Alameda, San Anselmo, Calif. 94960

Filed Sep. 7, 1979, Ser. No. 73,236

Int. Cl.[3] A44B *21/00;* A45D *8/26*

U.S. Cl. 24—3 R 1 Claim

1. An attachment device comprising:

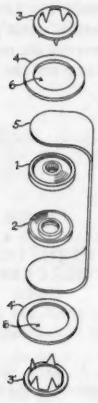
a snap fastener, including a stud, a socket, and a pair of pronged rings adapted for mating engagement with said stud and said socket;

a flexible hinge having first and second ends; and

A pair of annular rings sized to provide a manual grasping surface;

one said annular ring and said first end of said hinge captured between one said pronged ring and said stud, the other said annular ring and said second end of said hinge cap-

tured between the other said pronged ring and said socket, said annular rings having such dimensions to allow lever-



age to be applied to accommodate manual opening of said attachment device.

4,272,870

SYNTHETIC PLASTICS TIE MEMBER

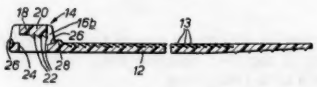
Mathew McCormick, Manchester, England, assignor to Bowthorpe-Hellermann Limited, Crawley, England

Filed Oct. 22, 1979, Ser. No. 87,211

Claims priority, application United Kingdom, Nov. 27, 1978, 46108/78; Feb. 12, 1979, 04810/79

Int. Cl.³ F16L *3/08*

U.S. Cl. 24—16 PB **7 Claims**



1. A unitary tie molded of synthetic plastic material, comprising

a flexible elongated planar strap member **(12)** including

(a) a body portion one surface of which contains a plurality of serrations **(13)** extending longitudinally between a pair of plain portions **(38*a*, 38*b*)**; and

(b) a head portion **(14)** connected with one end of said body portion, said head portion extending laterally of the strap member and including,

(1) a pair of side walls **(16*a*, 16*b*)** adjacent opposite longitudinal edges of said strap member, respectively;

(2) a cross-piece **(18)** extending transversely between said side walls;

(3) a pawl **(20)** pivotally connected at one end with said cross-piece, the other end of said pawl extending longitudinally of said strap member; and

(4) an abutment wall **(26)** extending transversely between said side walls generally opposite and spaced from said cross-piece and said pawl, said side walls, said cross-piece, said pawl, and said abutment wall being arranged to define an aperture **(25)** extending longitudinally through said head portion;

(5) said pawl including a plurality of teeth **(22)** opposite said abutment wall and having a configuration complementary to said serrations, each of said teeth defining an arcuate path, respectively, through said aperture during pivotal movement of said pawl;

(6) said side walls including longitudinal guide abutment surfaces **(36*a*, 36*b*)** adjacent said pawl opposite and spaced from said abutment wall, respectively, the distance between said abutment wall and said guide surfaces corresponding generally with the thickness of said body portion, whereby when the other end of said body portion is initially inserted within said aperture at the end thereof adjacent the pivotal end of said pawl, the body is guided during further longitudinal insertion through the aperture by the cooperation between said guide abutment surfaces and said marginal plane portions, respectively;

(7) the teeth on said pawl and the serrations on said body portion being operable upon subsequent displacement of said body portion in the opposite direction relative to the aperture to cause said pawl to pivot in the direction of said abutment wall to lock said body portion thereagainst.

4,272,871

HOSE COUPLING

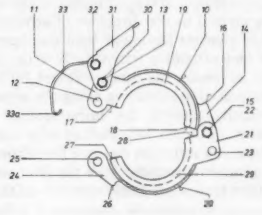
Karl Weinhold, Im Jagdfeld 43, Neuss 4040, Fed. Rep. of Germany

Filed Nov. 8, 1979, Ser. No. 92,347

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1978, 2849880

Int. Cl.³ F16L *37/20*

U.S. Cl. 24—270 **4 Claims**



1. An apparatus for connecting pipe or hose ends comprising at least two identical shell members which are connected at one end by means of a hinge bolt, and other ends of the shells being pressed together by a tensioning lever and a spring, the tensioning lever being mounted to the shell member by way of a bolt in a bore penetrating a part of the shell member, characterized in that the ends of the shell members pressed together by the tension lever have interlocking tongue **(11)** and cam **(24)** which are provided with another bore **(12,25)** through which another hinge bolt is passed.

4,272,872

DEVICE FOR HOLDING A THIN-WALLED METAL CYLINDER

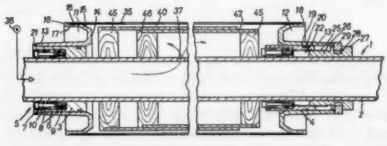
Anton Hess, Koppigen, and Ramon Bellot, Utzenstorf, both of Switzerland, assignors to Fritz Buser Maschinenfabrik AG, Switzerland

Filed Feb. 9, 1979, Ser. No. 10,955

Claims priority, application Switzerland, Feb. 14, 1978, 1630/78

Int. Cl.³ B21B *31/32, 31/08;* **G03B** *27/04;* **F16D** *1/00*

U.S. Cl. 29—113 R **10 Claims**



1. An apparatus for releasably holding a thin-walled cylinder, comprising

carrier means having fluid pressure supply means coupled thereto;

first and second hubs mounted on said carrier means, said first hub being adjustably mounted on said carrier means to vary the spacing between said hubs;

first and second centering flanges slidably and sealingly coupled to said first and second hubs, respectively, each said flange having an outer perimeter seat surface; and

a thin-walled cylinder having ends thereof mounted on said flanges, said cylinder and said flanges comprise means defining a pressure space in fluid communication with said fluid pressure supply means so that when pressure is supplied to said space by said fluid pressure supply means, axially extending, annular seal slit openings are formed between said cylinder and said outer perimeter seat surfaces of said flanges and in fluid communication with said pressure space.

4,272,873
STONE ROLLER

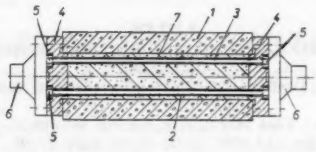
Robert Dietrich, Heidenheim-Grosskuchen, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Apr. 24, 1979, Ser. No. 32,920

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1978, 2818437

Int. Cl.³ D21F *3/08*

U.S. Cl. 29—123 **22 Claims**



1. A stone pressure roller for a paper making machine comprising:

a unitary cylindrical roller body comprised of stone; said roller body having opposite axial ends;

a respective clamping plate positioned at each said axial end of said roller body;

a plurality of tensioned tie-rods extending between said clamping plates and axially through said roller body, and said tie-rods being adapted to draw said clamping plates together to place said roller body under axial stress;

each said tie-rod passing through said roller body at a respective different angular position around said roller body than the other said tie-rods, and said tie-rods being spaced radially away from the axis of said roller body, whereby said plates are drawn toward each other at different angular positions around said plates and said roller body.

4,272,874
APPARATUS FOR STUFFING COMPRESSIBLE PRODUCTS INTO FLEXIBLE COVERS

Reuben J. Krein, Fort Smith, Ark., assignor to Coachmen Industries, Inc., Middlebury, Ind.

Continuation-in-part of Ser. No. 846,410, Oct. 28, 1977, abandoned. This application Jun. 25, 1979, Ser. No. 51,511

Int. Cl.³ B23P *19/02*

U.S. Cl. 29—235 **9 Claims**

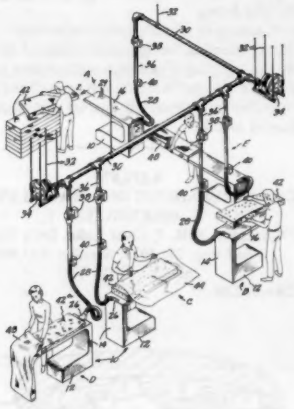
1. Apparatus for use in the application around an air pervious expanded flexible filler of a flexible cover envelope open at a margin thereof and of a size and shape when closed which closely conforms to the normal expanded size and shape of the filler, in combination,

a horizontal filler supporting member,

means mounting said supporting member in cantilevered relation to accommodate application of said opened flexible cover envelope around the free end of the supporting member and articles supported thereon,

means defining a plurality of air flow passages open in substantially uniformly spaced relation in at least a selected portion of the upper surface of said supporting member,

a flexible substantially air impervious sheet draped over said filler supporting member and a filler supported thereon and spanning all air flow passages not spanned by said filler, and



means located adjacent to said supporting means and connected to said passages to generate a sub atmospheric pressure in said passages and the space between said sheet and said supporting member and thereby collapse said filler and accommodate encirclement of said filler, sheet and the portion of said supporting member which supports said filler by said cover envelope when open.

4,272,875
DEVICE TO ALIGN THE END FITTINGS IN THE CASTING OF CONCRETE PILES

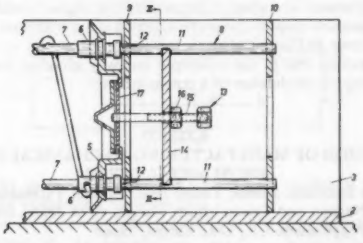
Frank O. Silvander, Richertsgatan 10, S-412 50 Göteborg, Sweden

Filed Aug. 27, 1979, Ser. No. 70,180

Claims priority, application Sweden, Jun. 12, 1979, 7905155

Int. Cl.³ B25B *27/14*

U.S. Cl. 29—271 **2 Claims**



1. An improved device designed to align the end fittings of concrete piles of the kind to be cast in elongate molds comprising a bottom section and two side walls, and having lengthwise extending reinforcement rods therein, the ends of which are provided with interconnecting members passing through the end fittings, the improvement comprising

an alignment member arranged to be positioned in said mold, said alignment member having faces spaced for position-

ing in abutting relationship with the bottom section and side walls of the mold at right angles to the lengthwise extension of the mold for locating said alignment member relative to the mold,

shoulders on said alignment member, said shoulders being juxtaposed to the interconnecting members when said alignment member is positioned in the mold for serving as points of abutment against the ends of the interconnecting members, and

a pulling member having means for providing a connection to the end fitting

a support means in said alignment member,

said pulling member being interconnected to said support means for exerting a pressure against said support means when tensioned for bringing the ends of the interconnecting member into abutment against said shoulders of said alignment member.

4,272,876

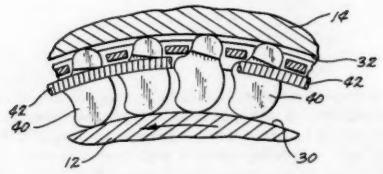
METHOD OF REPAIRING ONE-WAY CLUTCH DRIVE ASSEMBLIES

Vincent O. Schmitz, R.R. 1, Clear Lake, Iowa 50428

Filed Aug. 28, 1978, Ser. No. 937,403

Int. Cl.³ B23P *7/00*

U.S. Cl. 29—402.06 **5 Claims**



1. Method of repairing a one-way clutch drive assembly including an input shaft which drives an output gear through a one-way clutch mounted in the output gear on the input shaft by substituting a one-way clutch having sprags which are adapted to move radially between inner and outer races on the input shaft and the output gear, the improved method comprising the steps of,

taking an output gear and input shaft and discarding the used one-way clutch,

grinding the inner and/or outer races on the input shaft and output gear a predetermined total amount,

providing a supply of substitute one-way clutches having a common size which is larger than the original clutch by an amount equal to the predetermined amount ground off the inner and/or outer races,

installing one of the substitute one-way clutches from the supply of clutches of a common size.

4,272,877

METHOD OF MANUFACTURING MECHANICAL PARTS FROM METAL SCRAP

Keizo Takeuchi, Handa; Yoshio Iwai; Tadashi Yamanaka, both of Nagoya, and Tatsuo Miura, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation-in-part of Ser. No. 575,402, May 7, 1975. This application May 31, 1978, Ser. No. 911,221

Claims priority, application Japan, May 13, 1974, 49/53622; Jul. 1, 1974, 49/75724; Jul. 8, 1974, 49/78599; Jul. 24, 1974, 49/85476; Nov. 6, 1974, 49/127737

Int. Cl.³ B23Q *17/00*

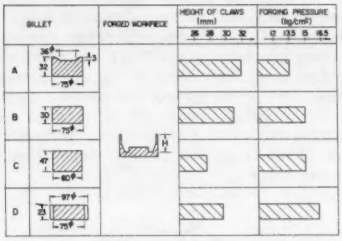
U.S. Cl. 29—403.2 **12 Claims**

1. A method of manufacturing a pole core of an alternator comprising a base portion, a boss portion, and at least one claw, from metal scrap, comprising the steps of,

preparing metal scrap comprising press chips, shavings and turnings;

forming a billet by pressing the metal scrap;

heating the billet to the forging temperature, whereby a satisfactory plasticity is given to the billet for plastic deformation of metal scrap in the succeeding process; and



forming the heated billet into a pole core of an alternator by use of a semi-closed forging die means, the shape of said pole core being selected such that substantially every part of said billet is deformed plastically by a degree of deformation sufficient to generate metallic bond at said substantially every part of the billet.

4,272,878

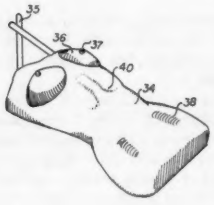
METHOD FOR MAKING HYPEREXTENSION ORTHOSIS

Michael B. Danforth, 718 Highland St., Altamonte Springs, Fla. 32701

Filed May 8, 1978, Ser. No. 903,498

Int. Cl.² B29C *13/00, 25/00;* **B29D** *31/00*

U.S. Cl. 29—526 R **5 Claims**



1. A method of making an anterior total contact hyperextension orthosis which utilizes contact with a patient's breasts as a supporting surface comprising the steps of:

placing a stockinette on a patient;

marking the stockinette with a transferrable dye to mark the position of the patient's breasts;

measuring the patient's breast for size in a standing or sitting position;

forming a cast on a patient's body over said stockinette with the patient being in a supine position;

removing the cast and forming a mold therein having the dye markings thereon transferred from the marking made on said stockinette for said patient's breast position;

mounting the mold onto a stand;

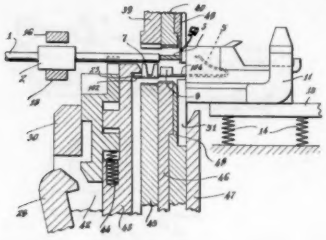
modifying the mold to conform to a patient, including mounting breast cup molded parts to conform to the measured patient's breast in a standing or sitting position on the dye marked portion of said mold; and

drape forming an anterior hyperextension orthosis on the mold formed to apply a uniform support pressure on the patient's breasts.

4,272,879
METHODS AND APPARATUS FOR MAKING ELECTRICAL CONNECTORS

Jon Wigby, 183 Sugar St., Newtown, Conn. 06470; Ralph L. Piatt, R.F.D. #2 Salem Rd., Pound Ridge, N.Y. 10576, and James D. Anderson, 2 Timothy Rd., Norwalk, Conn. 06850

Filed Feb. 5, 1979, Ser. No. 8,999
Int. Cl.[3] H01R 43/04
U.S. Cl. 29—566.2 3 Claims



1. A machine for installing electrical termination connectors simultaneously on the ends of a plurality of wires which have previously been coupled together and arrayed in substantially planar, parallel, spaced-apart relationship with bared conductor ends thereof exposed for presentation to said machine, comprising:

a base;

gripper means movable relative to said base in a direction transverse to the plane of a planar array of wires for gripping such an array in substantially fixed position relative to said base, at a point axially spaced from the ends of wires;

wire guide means having a plurality of open grooves for receiving individual wires therein, positioned between said gripper means and the ends of wires held therein, said guide means being movable in a direction transverse to the axes of wires held in said gripper means between a first non-engaging position and a second wire-engaging position;

connector support means for positioning a plurality of electrical contacts in position to receive the ends of individual wires held by said gripper means;

movable contact crimping means positioned to engage and deform a plurality of contact elements supported in said connector support means onto the ends of a plurality of wires held by said gripper means;

means for moving said gripper means in the direction of the axes of wires gripped therein to advance such wires axially into a connector supported in said connector support means together with contacts installed on such wires, when said guide means has moved from said wire-engaging position to said non-engaging position.

4,272,880
MOS/SOS PROCESS

Richard D. Pashley, Sunnyvale, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Apr. 20, 1979, Ser. No. 31,826
Int. Cl.[3] H01L 21/22
U.S. Cl. 29—571 17 Claims

1. A process for fabricating two MOS transistors having a common gate region on a substrate comprising the steps of:

forming a gate region insulated from said substrate, said gate region having an oxide member disposed above said gate region and a silicon nitride member disposed above said oxide member;

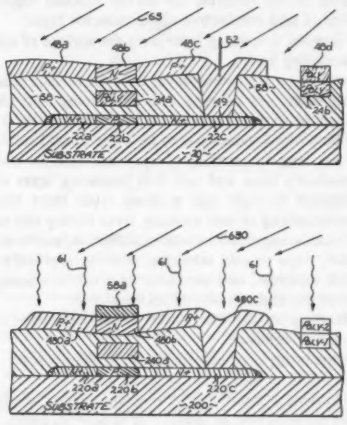
doping said substrate in alignment with said gate region to form first source and drain regions of a first MOS transistor;

forming an oxide layer on said substrate, said silicon nitride member preventing substantial oxide formation on said gate region during the oxide formation step;

doping said oxide layer and silicon nitride member;

removing said silicon nitride member;

forming a polysilicon layer over said oxide layer and said oxide member; and



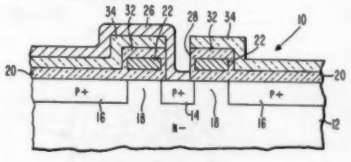
diffusing the dopant from said oxide layer into said polysilicon layer so as to form second source and drain regions of a second MOS transistor in said polysilicon layer in alignment with said common gate region,

whereby two MOS transistors are formed in vertical alignment with one another.

4,272,881
METHOD FOR MAKING A CLOSED GATE MOS TRANSISTOR WITH SELF-ALIGNED CONTACTS WITH DUAL PASSIVATION LAYER

Rodney L. Angle, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 20, 1979, Ser. No. 59,473
Int. Cl.[3] H01L 21/26
U.S. Cl. 29—571 17 Claims



1. The method of making a closed gate geometry MOS transistor comprising the steps of:

(a) selecting a semiconductor substrate of a first conductivity type;

(b) forming a first insulating layer on a surface of said substrate;

(c) forming a layer of semiconductor material on the surface of said first insulating layer;

(d) defining said layer of said semiconductor material to cover the areas where drains and gates will be located in the completed MOS transistor;

(e) removing the exposed portions of said first insulating layer to expose the surface of said substrate;

(f) introducing conductivity modifiers, opposite in conductivity type to said substrate, into the exposed surface of said substrate and into said layer of semiconductor material, said conductivity modifiers being used to form the source of said MOS transistor and to make said layer of semiconductor material conductive;

(g) forming a second insulating layer on the exposed portions of said substrate and on the exposed edges and surface of said conductive semiconductor layer;

(h) forming a masking layer over the surface of said second insulating layer;

(i) applying a photoresist layer over the surface of said masking layer and defining and developing said photoresist layer to expose portions of said masking layer through which ohmic contact is to be made to said substrate;

(j) removing the portions of said masking layer, said second insulating layer and said first insulating layer which are exposed through said masking layer there being some undercutting of said masking layer during this step;

(k) introducing conductivity modifiers, opposite in conductivity type to said substrate, into the exposed surface of said substrate, said conductivity modifiers being used to form the drain of said MOS transistor;

(l) forming an insulating layer on the exposed edges of said conductive layer;

(m) removing any insulating layer which directly underlies the edges of said masking layer; and

(n) applying a metallic layer over the surface of said device and defining said metallic layer to provide ohmic contacts and interconnects.

4,272,882

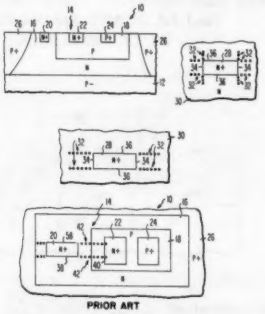
METHOD OF LAYING OUT AN INTEGRATED CIRCUIT WITH SPECIFIC ALIGNMENT OF THE COLLECTOR CONTACT WITH THE EMITTER REGION

Albert W. Fisher, East Amwell Township, Hunterdon County, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 8, 1980, Ser. No. 147,574

Int. Cl.³ H01L *21/22, 21/324*

U.S. Cl. 29—578 **2 Claims**



1. An improved method of laying-out an integrated circuit of the type which includes an NPN bipolar transistor having an emitter formed within a P type well which P type well is formed within an N type substrate in which a rectangular N+ collector contact is formed,

wherein the improvement comprises aligning the longer edges of said N+ contact in a direction substantially perpendicular to the direction between said contact and said emitter and not aligning any of said longer edges toward said emitter.

4,272,883

CONTINUOUS FILM CARRIER WIRE CONNECTING SYSTEM

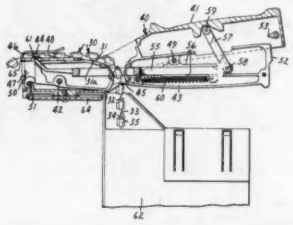
Leo E. Anthone, Little Canada, and Sidney J. Berglund, Stillwater, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 916,215, Jun. 16, 1978, Pat. No. 4,225,042.

This application Dec. 26, 1979, Ser. No. 107,430

Int. Cl.³ H01R *43/04*

U.S. Cl. 39—751 **2 Claims**



1. A hand tool adapted for crimping the foremost connector of a series of connectors supplied in receptacles in a film carrier strip onto wire ends inserted into said connector, said connector being of the type having a wire receiving body portion and a cap telescopically received in one face of the body and said carrier strip having compressible longitudinal edges alongside the connectors; said tool comprising:

an elongate housing having a longitudinal insertion passage for receiving said film carrier strip, said passage having an inlet and an exit and being spaced to contact the longitudinal edges of a said carrier strip and compress said edges as the carrier strip advances within said passage toward the passage exit, said housing having a channel near the exit from said passage which intersects said passage, said housing also having a compression member adjacent said passage exit;

a plunger slideably fitting within said channel and moveable across said passage toward said compression member;

an elongate handle member pivotally mounted on said housing and pivotally attached to said plunger for slideably moving said plunger within said channel and for applying crimping pressure to a connector retained at the intersection of said channel and said passage between said compresion member and said plunger;

check means within said longitudinal passage for preventing retraction of said carrier strip toward said passage inlet; said check means being positioned to engage the longitudinal edges of a said carrier strip alongside the connector when said connector is positioned in the intersection of said channel and said passage; and

advancing means for moving a connector on a said carrier strip into alignment with said compression means, said advancing means being positioned within said elongate housing and pivotally attached to said elongate handle member such that the applying of crimping pressure to said handle activates said advancing means.

4,272,884

SHAVING APPARATUS

Eduard W. Tietjens, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 27, 1979, Ser. No. 70,197

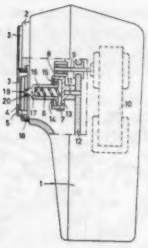
Claims priority, application Netherlands, Sep. 18, 1978, 7809462

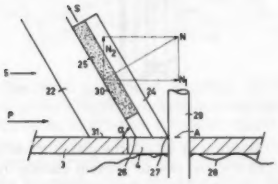
Int. Cl.³ B26B *19/14*

U.S. Cl. 30—43.6 **2 Claims**

1. A shaving apparatus having a cutting unit provided with at least one cutter, a lead cutter associated with and movable

relative to the cutter, and an element connecting the lead cutter to the cutter, said connecting element comprising a layer





of a material having rubber-elastic properties between the cutter and the lead cutter.

4,272,885

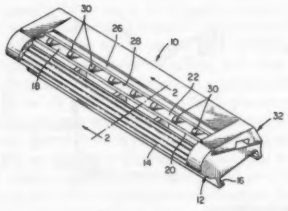
SHAVING CARTRIDGE

Frank A. Ferraro, Trumbull, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 831,469, Sep. 8, 1977, abandoned. This application Jan. 16, 1979, Ser. No. 3,825

Int. Cl.³ B26B *21/06, 21/22*

U.S. Cl. 30—47 **12 Claims**



1. A razor cartridge comprising:

a blade seat;

a seat blade having a cutting edge exposed for shaving;

a cap blade having a cutting edge extending rearwardly of and substantially parallel with said edge of said seat blade and exposed for shaving;

a cap; and

a spacer between said blades, said spacer having a forward margin disposed behind and in substantially parallel relationship with said cutting edge of said seat blade, said margin of said spacer including projections extending forwardly of said cap blade cutting edge for decreasing contact between said blade edges and the skin to reduce irritation in shaving with said cartridge, at least one of the projections having a forward extent greater than that of another of the projections and extending at least to a plane tangent to both cutting edges.

4,272,886

SHAVER UNIT

Tamoru Asano, Seki, Japan, assignor to Kai Cutlery Center Co., Ltd., Seki, Japan

Filed Mar. 27, 1979, Ser. No. 24,403

Claims priority, application Japan, Mar. 28, 1978, 53-38894

Int. Cl.³ B26B *21/06, 21/52*

U.S. Cl. 30—47 **3 Claims**

1. A shaver unit comprising in combination:

at least one shaving blade unit;

a case member including a top portion and a bottom portion, said top portion defining a recess for detachably receiving said blade unit for use during shaving, said top portion curvedly extending from said bottom portion for offsetting said blade unit in said recess from said bottom portion and properly orienting said blade unit for shaving, said bottom portion having sidewalls and a first planar rectangular panel therebetween, a portion of said case member being operable as a handle for guiding said blade during shaving; and

a cover member releasably interlocking with said case member and including a blade accommodating space for each blade unit for storing each blade unit in a fixed position when not in use during shaving and for dispensing said blade unit into said recess, said cover member including a second planar rectangular panel with a top and bottom wall, said second panel having an inner and an outer surface, said inner surface having walls associated therewith for partly defining said blade accommodating space, said second panel and said bottom portion interlocking so as to form a substantially box-like structure enclosing said blade accommodating space therewithin.

4,272,887

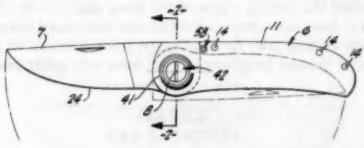
PIVOTING BLADE KNIFE

Paul W. Poehlmann, P.O. Box 487, Stinson Beach, Calif. 94970

Filed May 17, 1979, Ser. No. 40,066

Int. Cl.³ B26B *1/00*

U.S. Cl. 30—161 **1 Claim**



1. A pivoting blade knife comprising a plate having a plate opening therethrough, said plate opening having one part circular at one distance from a transverse axis and having a first pocket at a different distance from said axis; a blade having a transverse surface and having a blade opening therethrough, said blade opening having one part circular at said one distance from said axis and having a second pocket at a different distance from said axis; a sleeve concentric with said axis and fitting said circular parts of said plate opening and said blade opening; means for holding said sleeve against movement

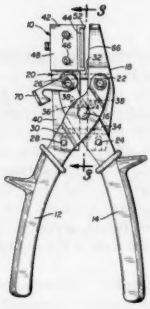
along said axis relative to said plate; means defining a third pocket in said sleeve; a bolt movable in said sleeve along said axis between a first position and a second position; means on said bolt slidably fitting said plate pocket and said blade pocket in said first position and fitting only one of said plate and blade pockets in said second position; means yieldably urging said bolt into said first position; a cross pin rotatable in said plate; and an eccentric portion on said pin adapted to abut said transverse surface.

4,272,888

PARALLEL ACTION CUTTING HAND TOOL

Ruben J. Hartmeister, 1034 6th St., Golden, Colo. 80401

Filed Dec. 17, 1979, Ser. No. 104,185
Int. Cl.³ B26B *13/00*
U.S. Cl. 30—229 **9 Claims**



1. A parallel action die cutting hand tool having a parallel action handle of the kind employing a pair of scissors-action handle levers pivoted on a transverse axis, each of the levers having a pivot pin both longitudinally to the rear and longitudinally to the front of the pivot axis and parallel thereto, the pivot axis and the pivot pins being normal to the plane of the parallel action handle, comprising:

(a) first and second die cutting jaws connected to the parallel action handle by engagement of the pivot pins, each jaw connected to a front pivot pin of one handle lever and a rear pivot pin of the opposite handle lever in corresponding pivot pin receiving openings in each jaw, at least one of the openings being longitudinally elongated;

(b) at least front and rear guide pins extending between said die cutting jaws and slidable with respect to at least one of the jaws, the pins being longitudinally spaced apart, each near a pivot pin and lying in the plane of the parallel action handle approximately in longitudinal alignment with the cutting edges of the jaws; and

(c) at least one compression member connected between the die cutting jaws for biasing the jaws to separated position and located longitudinally between said guide pins.

4,272,889

PORTABLE SAW

Lewis A. Scott, Lake Oswego, and Duane M. Gibson, Milwaukie, both of Oreg., assignors to Omark Industries, Inc., Portland, Oreg.

Filed Feb. 26, 1979, Ser. No. 14,862
Int. Cl.³ B27B *17/00*
U.S. Cl. 30—371 **18 Claims**

1. In a power saw:

a motor having a housing,

a guide plate attached to the housing,

a saw bar secured to the housing in a position extending from the guide plate and having a nose portion remote from the guide plate,

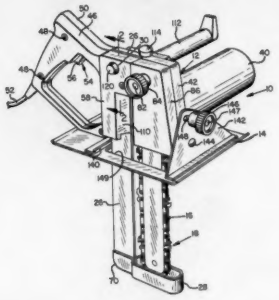
a sprocket driven by the motor,

a saw chain entrained about the sprocket and the saw bar,

a rigid guard bar having a thickness less than the thickness of said saw chain,

a guard member mounted on one end of the guard bar, and

mounting means mounting the guard bar on the housing in a position extending along a rear edge of the saw bar in the plane of the saw bar for longitudinal adjustment between



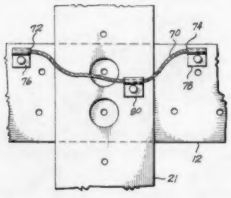
an extended position in which the guard member covers the nose portion of the saw to prevent cutting by the saw chain in the region of the nose portion and a retracted position in which the guard member is withdrawn from the nose portion to allow cutting in the region of the nose portion while normally exposing the forward edge of the saw bar.

4,272,890

LATTICE TEMPLATE

Edward J. Davert, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Nov. 30, 1979, Ser. No. 99,158
Int. Cl.³ G01B *3/00*; **E06B** *3/00*
U.S. Cl. 33—174 G **1 Claim**



1. In configuration:

a plurality of drill templates having holes extending therethrough, said plurality of drill templates extending in a predetermined direction;

a further plurality of drill templates having holes extending therethrough, said further plurality of drill templates extending in a further predetermined direction;

said plurality and said further plurality of drill templates forming points of intersection at respective points of overlap with each other;

means for providing limited relative motion between said plurality and said further plurality of drill templates at said points of intersection; and,

wherein said means for providing limited relative motion between said plurality and said further plurality of drill templates comprises a cable member disposed at each of said points of intersection, each of said cable members having the ends thereof fastened to corresponding ones of said plurality of drill templates at each of said points of intersection, and a portion intermediate the ends thereof

fastened to corresponding ones of said further plurality of drill templates at each of said points of intersection.

4,272,891

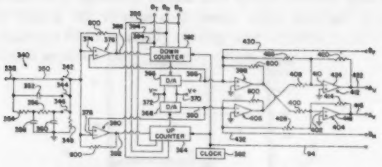
ELECTRONIC GEAR CHECKER

Mario P. Fusari, Leyden, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 939,045, Sep. 1, 1978, abandoned. This application Jul. 23, 1979, Ser. No. 59,827

Int. Cl.[3] G01B *7/00, 7/28, 7/30*

U.S. Cl. 33—179.5 B **51 Claims**



1. A functional workpiece checking machine comprising means mounting a master workpiece in engagement with a test workpiece so as to produce a relative displacement between said master workpiece and said test workpiece when relative motion occurs therebetween in a predetermined manner, sensing means for producing a checking signal that is representative of said relative displacement wherein said checking signal undergoes an excursion of a maximum magnitude in a particular direction from a reference level as said relative motion occurs and successive approximation means comprising comparison means coupled to receive said checking signal, counting means initially set to a count representative of a signal level that is of a greater magnitude in said particular direction than said excursion, said counting means being constructed to count in a periodic manner so that its count is representative of a signal level that approaches said maximum magnitude excursion as said count continues, digital-to-analog converter means coupled to said counting means so as to convert the count in said counting means to an analog level, the output of said converter means being coupled to said comparison means and the output of said comparison means being coupled to said counting means for stopping said counting means from further counting when said checking signal is approximately equal to the level represented by the count in said counting means.

26. A functional workpiece checking machine comprising means mounting a master workpiece in engagement with a test workpiece so as to provide a relative displacement between said master workpiece and said test workpiece when relative motion occurs therebetween in a predetermined manner, sensing means for producing a checking signal that is representative of said relative displacement and signal processing means for processing said checking signal to determine the characteristics of said test workpieces that are represented by said checking signal wherein said sensing means comprises an operational amplifier comprising a difference amplifier that has an inverting and a non-inverting input terminal, a pair of complementary transistors that have their emitters connected together, their bases coupled to the output of said difference amplifier, and their collector-emitter paths coupled in series across a power supply that supplies a positive voltage at one terminal and a negative voltage at the other and a feed-back resistor coupled at one end to said emitters and its other end to the inverting input terminal of said difference amplifier.

28. A functional workpiece checking machine comprising means mounting a master workpiece in engagement with a test workpiece so as to produce a relative displacement between said master workpiece and said test workpiece when relative motion occurs therebetween in a predetermined manner, a single sensing means coupled to produce a checking signal that is representative of said relative displacement, a plurality of signal processing means for simultaneously processing input signals to said processing means and for producing output signals representative of various desired components of said checking signal, said signal processing means each comprising successive approximation detection and storage means for detecting maximum excursions of their respective input signals with respect to a reference level and filter means that is capable of operating in a plurality of different filtering modes inserted between said sensing means and said signal processing means for filtering said checking signal and for supplying said filtered checking signal as an input signal to selected ones of said signal processing means, and mode selection means for selecting a predetermined filtering mode for each of said selected ones of said signal processing means.

32. A functional workpiece checking machine comprising means mounting a master workpiece in engagement with a test workpiece so as to produce a relative displacement between said master workpiece and said test workpiece when relative motion occurs therebetween in a predetermined manner, sensing means for producing output signals representative of said relative displacement with respect to two planes normal to each other, first and second signal processing means for processing said output signals comprising first and second successive approximation detection and storage means for respectively detecting and storing first and second signal levels representative of the maximum range of said relative displacement with respect to each of said planes and combining means for combining said first and second signal levels in a predetermined manner.

34. A functional workpiece checking machine comprising means mounting a master workpiece in engagement with a test workpiece so as to produce a relative displacement between said master workpiece and said test workpiece when relative motion occurs therebetween in a predetermined manner, first sensing means associated with a first predetermined line of relative travel with respect to said test workpiece to produce a first checking signal as said relative motion occurs, second sensing means associated with a second predetermined line of travel with respect to said test workpiece to produce a second checking signal as said relative motion occurs, signal processing means comprising first and second successive approximation detection and storage means for detecting and storing first and second signal levels each of which are respectively representative of maximum excursions of said first and said second checking signals and combining means for combining said first and second signal levels in a predetermined manner.

4,272,892

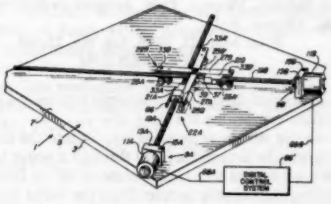
AUTOMATIC TEST PROBE POSITIONING APPARATUS

Stanley E. Rose, Phoenix, Ariz., assignor to Omnicomp, Inc., Phoenix, Ariz.

Filed Aug. 10, 1979, Ser. No. 65,539

Int. Cl.[3] G01B *5/00;* **B27G** *23/00*

U.S. Cl. 33—185 R **19 Claims**



1. A test probe system for use in automatic testing of printed circuit boards, said test probe system comprising in combination:

a. a substantially flat slide surface;

b. first and second threaded shafts extending over said slide surface, said first and second threaded shafts being sub-

stantially parallel to said slide surface, said first threaded shaft crossing over said second threaded shaft;

c. first and second drive means for controllably axially rotating said first and second threaded shafts, respectively;

d. support means for supporting said first and second drive means, said support means having first and second points located in fixed relationship to said slide surface;

e. pivot means for pivotally connecting said first and second drive means to said support means at said first and second points, said first and second threaded shafts being pivotable laterally over said slide surface;

f. first and second shaft receiving means for receiving said first and second shafts, respectively;

g. connecting means for pivotally connecting said first and second shaft receiving means, a triangle substantially parallel to said slide surface being defined by said first and second points and a point at which said connecting means pivotally connects said first and second shaft receiving means, the angles and lengths of the sides of the triangle being variably dependent on the angular positions of said first and second threaded shafts with respect to first and second reference angular positions of said first and second threaded shafts, respectively; and

h. probe support means carried by one of said first and second shaft receiving means for supporting a first conductive probe.

4,272,893

ENHANCING THE CHARACTERISTICS OF MAGNETICALLY STABILIZED FLUIDIZED BEDS

Octave Levenspiel, Corvallis, Oreg., and Kenneth Kamholz, Cherry Hill, N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 711,500, Aug. 4, 1976, Pat. No. 4,143,469. This application Mar. 6, 1979, Ser. No. 18,060

Int. Cl.³ F26B *3/08*

U.S. Cl. 34—1 **3 Claims**

1. In a process for fluidizing a bed containing solid particulate magnetizable, fluidizable material within an external force field, wherein said bed of fluidizable material is fluidized by a flow of gas therethrough with sufficient force to oppose an external force field acting on said particulate material, and wherein said fluidized bed is subjected to a magnetic field having a substantial component positioned in the direction of said external force field, the improvement which comprises: periodically removing the magnetic field from the fluidized bed so as to promote mixing of the solids in the fluidized bed and then reapplying the magnetic field before the bed visibly exhibits "boiling" or "bubbling" typical of unstabilized fluidized bed operation.

4,272,894

DRYING STEP IN A METHOD OF PRODUCING CERAMIC ARTICLES

Antonio Salviati, Vicenza, Italy, assignor to Salviati Impianti S.p.A., Vicenza, Italy

Filed Mar. 21, 1979, Ser. No. 22,464

Int. Cl.³ F26B *3/04*

U.S. Cl. 34—9 **5 Claims**

1. A method of drying green ceramic articles in a continuous tunnel drier comprising the steps of

introducing the green ceramic articles into the tunnel drier,

conveying the ceramic articles through a water bath where they are heated to a temperature of 40° to 100°,

removing the ceramic articles from the water bath,

heating the green ceramic articles in the drier to a drying temperature while maintaining them at a moisture content substantially equal to that existing at the beginning of the heating steps; and

drying the green articles previously heated;

said heating and drying steps being carried out by passing a stream of hot air in co-current relationship with the green ceramic articles entering the tunnel drier, said stream of hot air having a temperature of from 120° to 140° C. and a moisture content of from 48 to 850 g of water per kg of dry air.

4,272,895

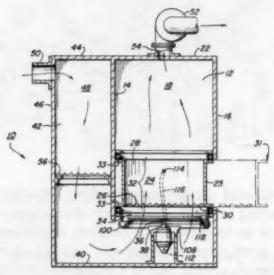
PRODUCT RECLAMATION IN A FLUID BED DRYER

Len Bentzien, Menomonie Falls, Wis., assignor to Universal Foods Corporation, Milwaukee, Wis.

Filed Nov. 7, 1979, Ser. No. 92,216

Int. Cl.³ F26B *3/08*

U.S. Cl. 34—10 **16 Claims**



1. In a fluidized bed apparatus for drying of particulate material which comprises a vertically disposed fluidizing chamber, means for passing a current of air through said fluidizing chamber, and an apertured disc shaped element rotatably mounted in a second chamber below said fluidizing chamber and adapted to interrupt a current of air passing through said fluidizing chamber, the improvement comprising:

accumulator means disposed in said second chamber and surrounding said disc shaped element for accumulating particles of said material which fall upon said disc shaped element;

passing means for interconnecting said second chamber and said fluidizing chamber; and

collector means coupled to said accumulator means for concentrating and transferring said particles to said passage means.

4,272,896

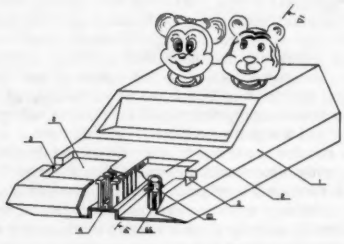
EDUCATIONAL TOY

Sydarsis Liou, No. 137, Chung Shan Rd., Chuou Lan Town, Miao Li Hsien, Taiwan

Filed May 30, 1979, Ser. No. 43,829

Int. Cl.³ G09B *7/00*

U.S. Cl. 434—340 **7 Claims**



1. An educational toy comprising a frame structure, two compartments provided on the surface of said frame structure, a series of selected quiz and answer boards, one compartment for receiving said quiz boards and the other compartment for

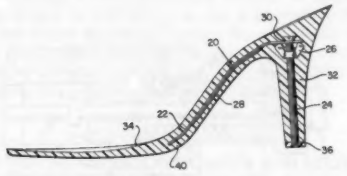
receiving said answer boards, a bar disposed beneath said compartments comprising a base and a plurality of flexible upright stems disposed in two rows along opposite longitudinal sides of said base having heads exposed to said compartments and accessible to the quiz and answer boards placed therein, ejecting means for ejecting an answer board from said other compartment to signify the answer is negative and indicating means for showing that an answer is affirmative, separate electrically operated means for individually actuating said ejecting and indicating means, electrical contacts on said stems and electrical circuitry connecting said contacts and said separate electrically operated means, and means on said quiz and answer boards for flexing said stems when inserted in said compartments for selectively closing said contacts to activate one of said separate electrically operated means.

4,272,897

STEEL SHANK SUPPORT FOR MOLDED UNIT SOLE

Gerald J. Ponce, 8956 Burnt Oak Dr., St. Louis, Mo. 63123

Filed Nov. 13, 1979, Ser. No. 93,791
Int. Cl.³ A43B *13/28, 21/36, 13/42*
U.S. Cl. 36—24.5 **9 Claims**



1. In a molded unit sole for a lady's high heel shoe, a shoe shank support suitable for being molded into said unit sole and which provides stability from side to side and heel to toe comprising a shank of sufficient length to extend from the heel area to approximately the beginning of the ball of the foot, said shank having means defining a hole therein, a detachable heel post for strengthening the heel, said heel post being threaded, and means to fix said heel post within said shank hole including a wing nut for reverse threading onto said heel post.

4,272,898

RESIN-COATED FIBER MASS CONTAINING CATALYST-FILLED HOLLOW FIBERS

Horace A. Tansill, Box 278, Santa Barbara, Calif. 93102

Division of Ser. No. 665,805, Mar. 11, 1976, Pat. No. 4,128,951, which is a continuation of Ser. No. 412,581, Nov. 5, 1973, abandoned. This application Jul. 31, 1978, Ser. No. 929,257
Int. Cl.³ A43B *13/38;* **A61F** *5/04*
U.S. Cl. 36—44 **7 Claims**

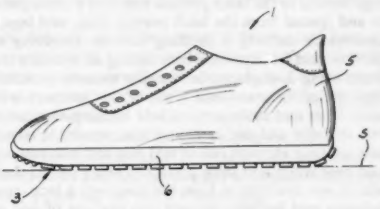
1. An article comprising a mass of coherent fibers, said mass comprising, as a first portion, fibers having a curable substance coated thereon and, as a second portion, pliant hollow fibers uniformly dispersed in said coated fibers and being capable of being rendered frangible, said hollow fibers containing a curing agent for said curable substance.

4,272,899

FOOTWEAR

Jeffrey S. Brooks, 11630 Chieftain Dr., St. Louis County, Mo. 63141

Filed Oct. 15, 1979, Ser. No. 84,832
Int. Cl.³ A43B *5/00, 23/08*
U.S. Cl. 36—129 **127 Claims**



1. Footwear, such as a running shoe, comprising a sole and an upper, the sole having:

(a) a heel section for the bottom of the heel of the foot;

(b) an arch section forward of the heel section for the bottom of the arch of the foot;

(c) a forefoot section forward of the arch section having a forward portion for supporting the metatarsal heads and toes of the foot and a rear portion for supporting the part of the foot immediately rearward of the metatarsal heads;

(d) medial and lateral sides;

the sole being so formed that when it is unstressed and disposed on a generally flat horizontal surface:

(e) the upper foot-supporting surfaces of said heel and arch sections are inclined generally downwardly from the medial to the lateral side of the sole;

(f) the arch section at the medial side of the sole being elevated in relation to the forefoot section for supporting the bottom of the arch of the foot at an elevation of from 0.5–3 cm above a line which, as viewed from the medial side of the shoe, extends between the upper foot-supporting surface of the heel section and an area on the upper surface of the forward portion of the forefoot section generally corresponding to the area on which the first metatarsal head is adapted to lie, said 0.5–3 cm being measured from the top of the arch section at its sole side vertically downwardly to said line;

(g) the arch section being compressible at its medial side in relation to said line no more than about 0.5 cm, as measured vertically downwardly from the top of the arch section, on impact of the sole during running.

4,272,900

IDENTITY BAND

Bernard G. MacLarty, Bedfordview, and Bryan Sidders, Germiston, both of South Africa, assignors to Promex Plastics (Proprietary) Limited, South Africa

Continuation-in-part of Ser. No. 811,779, Jun. 30, 1977, abandoned. This application Aug. 30, 1979, Ser. No. 71,258
Claims priority, application South Africa, Sep. 27, 1976, 76/5777; Mar. 17, 1977, 77/1615
Int. Cl.³ G09F *03/14*
U.S. Cl. 40—21 C **7 Claims**

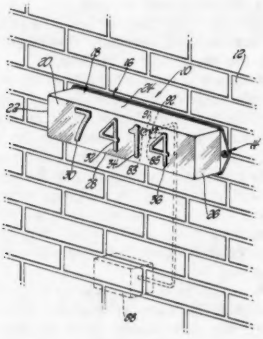
1. An identity band capable of being formed into a loop, comprising an elongate strap portion having opposed major

faces and a series of apertures therein, each aperture having two spaced apart transverse walls, one transverse wall of each aperture constituting a camming face and the other transverse wall of each aperture constituting a stop face, the camming and stop faces being skew to said major faces and thus both intersecting said major faces at angles other than right angles, and a latch portion adjacent one end of the band, the latch portion including a latch portion base and an arch formation including legs normal to the latch portion base and a cross-piece parallel to and spaced from the latch portion base, said legs, base and cross-piece defining a latching slot for receiving said strap portion, said latch portion base having an aperture therein and there being a displaceable latching element protruding from that one of the transverse walls of this aperture which is remote from said strap portion, said latching element extending into said slot, and said camming faces serving in turn to deflect said latching element out of said slot and into said aperture in said base while said strap portion is being passed through said slot in one direction to form the band into a loop, engagement between said latching element and any one of said stop faces preventing withdrawal of the strap portion from the slot in the opposite direction, a portion of the band being adapted to receive identification information.

4,272,901
LIGHTED ADDRESS SIGN

David R. Matthews, 1613 Waltham Dr., Ann Arbor, Mich. 48103

Filed Jun. 27, 1978, Ser. No. 919,636
Int. Cl.³ G09F *13/08*
U.S. Cl. 40—574 **3 Claims**

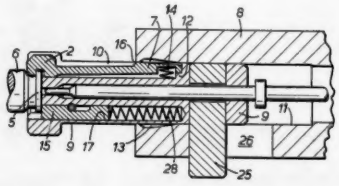


1. An address sign adapted to display a house address number or the like and to provide low intensity illumination in a localized area such as a house entrance, said sign comprising an elongated rectangular back plate being adapted to be mounted on a support member, a boxlike cover of rigid self-supporting translucent material having a rectangular front panel with a configuration the same as the back plate and being disposed in spaced parallel relationship with said back plate, said cover having a length greater than its width and comprising four side panels unitary with said front panel and extending perpendicular thereto with the edges of the side panels seated upon said back plate, a set of miniature incandescent lamps mounted on the back plate and disposed on the longitudinal center line thereof, the length of the cover being greater than the width by a factor approximately equal to the number of lamps in said set, a plurality of alphanumeric characters of opaque material disposed on one of said panels in spaced relation along the longitudinal center line, said lamps being spaced along the center line with the distance between adjacent lamps being about twice the distance from each lamp to the nearest side panel, the front panel being spaced further from the lamps than the side panels but less than the distance between adjacent lamps, said translucent material of said cover having a light transmission factor in the range of 0.28 to 0.32 whereby the front panel is illuminated with uniform intensity over the entire surface thereof to provide enhanced readability of the characters from a distance and whereby the side panels have a minimized front-to-back dimension and are illuminated with uniform intensity over the entire surface areas to provide low level ambient lighting; said back plate being provided with a first mounting flange at one end thereof and a second mounting flange at the other end thereof, the side panels of the cover at opposite ends thereof having first and second cover flanges unitary therewith in overlying relationship with the respective mounting flanges on said back plate and first fastener means extending through both of said first flanges, and second fastener means extending through both of said second flanges for securing said cover to said back plate and for securing said sign to said support member.

4,272,902
FIRE-ARMS

Frank E. Waters, Brentwood, England, assignor to Chartered Industries of Singapore Private Limited, Jalan Boon Lay, Singapore

Filed Dec. 4, 1978, Ser. No. 966,386
Claims priority, application United Kingdom, Dec. 5, 1977, 50593/77
Int. Cl.³ F41C *15/12*
U.S. Cl. 42—25 **10 Claims**



1. A bolt assembly for a fire-arm, the assembly comprising a reciprocable bolt carrier, a bolt reciprocably received in and rotatable relative to the bolt carrier, a recess in the bolt and an extractor having a body which in unassembled condition of the bolt and bolt carrier is freely placeable in and removable from the recess in the bolt, and which is pivotally retained in the recess in the assembled condition of the bolt assembly by the bolt carrier, the extractor and recess being shaped to hold the extractor relative to the bolt for reciprocation and rotation of the bolt relative to the bolt carrier and the extractor having a head for engaging a cartridge case in a first position of relative reciprocation of the bolt and bolt carrier, the extractor being held by the bolt carrier in a first pivotal position in which the extractor head will in use be engaged with a cartridge case to withdraw the case from the chamber of the fire-arm while in a second position of relative reciprocation of the bolt and the bolt carrier the extractor being pivotable to a second position from which the head can move to engage with a cartridge.

4,272,903
REVOLVER RELOADING DEVICE

William T. Griffis, 34122 Seville Pl. #C, Dana Point, Calif. 92629

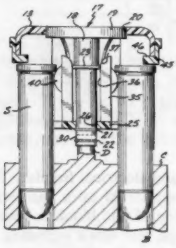
Filed Mar. 19, 1979, Ser. No. 21,980
Int. Cl.³ F42B *39/04*
U.S. Cl. 42—89 **5 Claims**

1. A reloading device for retaining a plurality of cartridges in alignment for receipt in a cylinder of a revolver, which cylinder includes a center shaft, and for releasing said cartridges upon manual application of said reloading device against said center shaft of said cylinder, comprising:

a cylindrical housing conformed as a segment of a cylinder

including a cap at one end thereof, a plurality of peripherally spaced grooves formed in the exterior surface of said housing, a central cavity extending axially through the interior of said housing and said cap, said central cavity communicating with said grooves, said grooves being confomred to receive said cartridges therein;

a latching spider received on the interior of said central cavity and including a plurality of flexible latches each aligned to extend into the interior of said grooves for retaining said cartridges therein; and



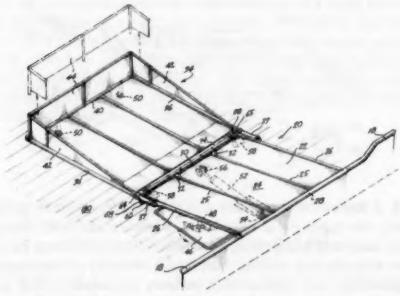
a center post assembly deployed on the interior of said central cavity and adapted for axial articulation therein, said assembly including a radial projection adapted to oppose the releasing flexure of said latches in one axial position thereof and an end fitting adapted to engage the end of said center shaft of said cylinder whereby the axial articulation of said assembly by said shaft from said one axial position will allow for releasing flexure of said latches.

4,272,904

CRAB POT HANDLING APPARATUS AND METHOD

Gilbert W. Francklyn, 1160 Comyn Rd. NW., Poulsbo, Wash. 98370

Filed Oct. 9, 1979, Ser. No. 82,743
Int. Cl.[3] A01K *69/08*
U.S. Cl. 43—4.5 **6 Claims**



1. An apparatus for receiving, holding and disposing of a crab pot catch comprising:

a first structural frame means having a pivotal engagement with a crab harvesting vessel near the gunwale for rotation from a first sorting position to a second dumping position and having first crab pot engaging means thereon for supporting and launching a crab pot;

a second structural frame means pivotally interconnected to said first frame means and having a sorting surface thereon for recovering crabs said second frame means adapted for rotation into stowed engagement upon said first frame means;

upstanding enclosure means along portions of the periphery of said second structural frame forming with said sorting surface a sorting bin means for receiving and holding the crab pot catch; and

means for rotating said first structural frame means about said pivotal engagement from said first sorting position to said second dumping position whereby the non-harvestable portion of the catch not removed from said sorting bin means are dumped overboard.

6. A method of handling and sorting a crab pot catch comprising:

removing the crab pot from a water body to a crab harvesting vessel having a crab pot launching surface pivotally mounted on the gunwale of said vessel, said surface having a sorting surface pivotally attached to the edge opposite the pivotal mount on said gunwale;

placing the crab pot catch on said sorting surface;

sorting the harvestable crabs from said crab pot catch so confined on said sorting surface and simultaneously rebaiting and preparing the pot for launching;

rotating said launching surface upwardly to launch said pot;

pivoting said launching surface downwardly and then locking said launching and said sorting surfaces together to prevent relative rotation there between and to form a disposal slide for dumping debris from said sorting surface; and

dumping the non-harvestable portion of said catch remaining on said sorting surface into the surrounding water body by rotating said sorting surface and launching surface into an inclined position.

4,272,905

GIG WITH REMOVABLE TINES

Ernest G. Hinkle, 12431 SW. First Pl., Plantation, Fla. 33325

Filed Dec. 13, 1978, Ser. No. 969,283
Int. Cl.[3] A01K *81/04*
U.S. Cl. 43—6 **3 Claims**

1. A gig for catching animals, comprising:

an elongated body having a longitudinal center line, a forward end and a rear end;

said body including a first body aperture in said body and a second body means spaced from said first body aperture along a line parallel to the longitudinal center line of said body;

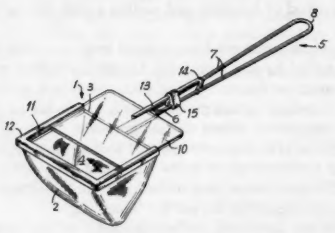
a spear means connected in one fixed workable position to said body and positioned on the surface of said body generally parallel to the longitudinal center line of said body;

said spear means including a barbed first end positioned beyond said forward end of said body, a second end means for insertion through said first body aperture, and a second means positioned between said barbed first end and said second end means, said secured means for positioning said spear means; and

a quick release biasing securing means disposed about said spear means and said surface of said body adjacent said second body means for removably securing said spear means to said body in a fixed position, said quick release biasing securing means for quick movement from a secured position to a spear released position by finger or thumb movement;

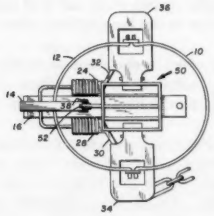
said movable means includes a gap for removing and replacing said spear means from said body whereby said gig may be easily assembled and disassembled for safe storage and shipment when not in use.

4,272,906
CLOSEABLE FISH NET
Gary Liebling, Calle 2, R-10 Jardines Fagot, Ponce, P.R. 00731
Filed Aug. 14, 1978, Ser. No. 933,290
Int. Cl.[3] A01K 77/00
U.S. Cl. 43—11 17 Claims



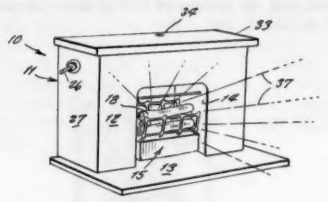
1. A fish net comprising a rigid frame, a container of flexible netting material mounted on said frame and defining therewith an opening for entry of fish into the container, a fitting mounted on said frame around said opening, said frame having a round cross-section, said netting having an edge wrapped around said frame, said fitting being U-shaped in cross-section and mounted over said frame and the netting wrapped thereon, rigid cover means slidably supported by said fitting for movement in a plane between a retracted position and an extended position, said cover means having a dimension corresponding to the size of said opening to close said opening in said extended position, said opening being open and accessible with said cover means in the retracted position and actuator means coupled to said cover means for moving the cover means between the retracted and extended positions.

4,272,907
ANIMAL TRAP
Victor Skapura, P.O. Box 77, Lore City, Ohio 43755
Filed Aug. 29, 1979, Ser. No. 70,838
Int. Cl.[3] A01M 23/26
U.S. Cl. 43—92 10 Claims



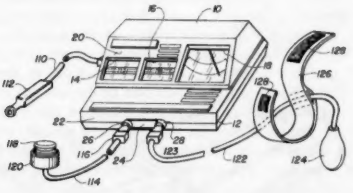
1. An improved spring-actuated leg-hold animal trap of the type having a trap pan pivotally mounted on the trap frame with a shank for engaging a trigger lever, which holds the trap in a set position, the trap pan defining a substantially horizontal plane, whereby upon movement of the trap pan the trigger lever is released and the trap is closed, the improvement wherein the trap pan is formed of at least one thin flat elongate element affixed to the shank, wherein all downwardly facing surfaces, in relation to the defined horizontal plane, of said at least one thin flat elongate element are tapered, substantially forming a knife edge.

4,272,908
ELECTRIFIED DOLL HOUSE FIREPLACE
Henry Bassetti, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of, New York, N.Y. 10007
Filed Jun. 15, 1979, Ser. No. 48,748
Int. Cl.[3] A63H 33/00
U.S. Cl. 46—12 3 Claims



1. A miniaturized electrical fireplace for a doll house comprising a block supported on a base with a mantle secured pivotally to the top of said block in combination with a grate and simulated logs, said block including a recess at the block bottom adapted to receive said grate supported on said base, said grate comprising a support with opposing grate mesh retainers for supporting said simulated logs, said support including a notched out portion to receive therein at least one lamp mounted on said base, said retainers having means for supporting said logs in a manner to obscure said lamp, said block further including hollowed out portions and an electrical circuit including battery means located therein for lighting said lamp.

4,272,909
TOY MEDICAL MONITOR UNIT
Kwok W. Tsui, Hong Kong, Hong Kong, assignor to Arco Industries Ltd., Hong Kong, Hong Kong
Filed Apr. 25, 1980, Ser. No. 143,851
Int. Cl.[3] A63H 33/30, 29/16
U.S. Cl. 46—39 7 Claims



1. A toy medical monitor unit to simulate registering respectively on gages pulse rate, blood pressure and body temperature, said unit comprising in combination, a housing having a base and viewing openings therein, a plurality of automatically expandable and contractable bellows mounted to said unit, a plurality of cylindrical drums supported within said housing adjacent said viewing openings, indicia respectively on said drums simulating reading of pulse rate and blood pressure, a plurality of cylinder and piston units within said housing respectively adjacent said drums, tube means connecting one end of each bellows with one end of a respective cylinder and operable to reciprocate said pistons in said cylinders in opposite directions respectively by means of air pressure and suction induced by manual compression and automatic expansion of said bellows, means connected to said pistons and operable to move said drums to display certain fictitious pulse rate and blood pressure indicating indicia on said drums respectively in said viewing openings, an arcuate scale in said housing viewable through another one of said plurality of viewing openings, a dial finger rotatably supported for movement of said finger

relative to said scale to simulate body temperature, another bellows similar to said aforementioned bellows mounted within said housing adjacent said scale and havng one end anchored relative to said base of said housing, a reciprocable member fixed to one end of said other bellows and engageable with said dial finger to rotate it relative to said scale, and a tube having one end connected to said other bellows and the other end having a mouthpiece operable to be blown by a child to expand said other bellows to produce movement of said dial finger in one direction and release of said pressure automatically permitting said other bellows to retract and restore said dial finger to initial position relative to said scale.

4,272,910

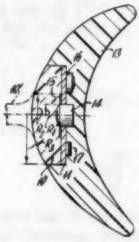
OCULAR PROSTHETIC OR THE LIKE

William R. Danz, 87 Park Ave., Glen Rock, N.J. 07452

Continuation-in-part of Ser. No. 62,329, Jul. 31, 1979, abandoned. This application Jul. 10, 1980, Ser. No. 164,943

Int. Cl.³ A63H *33/26, 3/38;* **A61F** *1/16*

U.S. Cl. 46—45 **26 Claims**



21. An artificial eye, comprising a substrate having a front surface bearing iris indicia characterized by a central dark circular area sized to simulate a pupil in a bright-light environment, said iris indicia further including an annular area surrounding the pupil-simulating area and colored and sized to simulate the remaining area of a simulated iris, a flat electro-optically sensitive annulus in front of said iris-simulating area and extending radially outward from said dark area to a radial extent to correspond with the outer diameter of a pupil that has been dilated due to a light environment of intensity less than that of said bright environment, electric-circuit means carried by said substrate with excitation connections to said electro-optically sensitive annulus, and eye-simulating body means mounting said substrate and providing a transparent covering of at least said pupil-simulating region.

4,272,911

SPINNING TOY

Manfred Strauss, Randolph, N.J., assignor to Shelcore, Inc., New York, N.Y.

Filed Sep. 25, 1978, Ser. No. 945,401

Int. Cl.³ A63H *1/32*

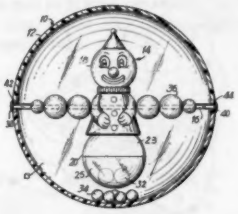
U.S. Cl. 46—47 **10 Claims**

1. A spinning toy comprising:

a transparent outer shell with a hollow interior, the exterior surface of said shell being in the shape of a surface of revolution with an axis of symmetry so that it may be rolled about said axis along a horizontal surface,

an object disposed within said shell and spaced from the interior surface thereof, said object being visible through said shell from the exterior surface thereof, and

a flexible elastomeric support band having end portions thereof fixedly secured to spaced points of the shell located on said axis of symmetry, said band supporting and being fixed to said object between said points, the center of gravity of said object being below said band, rotation of said shell about said axis of symmetry as it rolls in one direction on said surface causing said band to initially twist against the rotational inertia of said object without initially causing said object to spin, said object being sufficiently light in weight so that when after a finite time interval which sufficient energy has been stored up in said band by rolling of the shell on said surface in said one direction, the rotational inertia of the object is overcome by the stored energy in the band to suddenly spin the object without causing the toy to roll in a direction oppo-



site to said one direction, whereby said band untwists completely to spin said object about the length of the band, the momentum of the spinning object causing said band to twist beyond the relaxed state and in an opposite or reverse sense of direction compared to the initial twisting of said band, said object rotating and counter-rotating about said band until friction substantially dissipates the stored energy.

4,272,912

AIRPLANE MODEL WITH FLEXIBLE STRUT ASSEMBLY

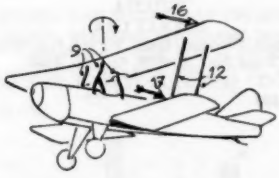
Philippe Lapierre, 4, rue Pauly, 75014 Paris, France

Filed Jun. 4, 1979, Ser. No. 44,951

Claims priority, application France, Jun. 20, 1978, 78 18340

Int. Cl.³ A63H *27/00*

U.S. Cl. 46—79 **5 Claims**



1. An airplane model, comprising:

a fuselage;

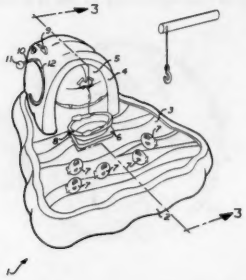
a wing assembly including an upper wing comprised of two half-wing sections; and

strut brace means including a plurality of center section struts for directly securing said upper wing to said fuselage in a substantially fixed relationship which is maintained during repeated use of the model, each said strut being made from a resilient material whereby said strut brace means acts to return said upper wing to said fixed relationship with said fuselage upon the occurrence of forces applied to the wing assembly which result in movement of said upper wing with respect to said fuselage and said strut brace means further including an oblique strut assembly for connecting each half-wing section to the fuselage with each oblique strut assembly being connected to at least a first point on said fuselage in one of a flexible and hinged manner and to at least a second point on said fuselage in a sliding manner.

4,272,913
SIMULATED MONSTER TOY AND GAME

Jeffery R. Bisch, 1635 Nineteenth St., Manhattan Beach, Calif. 90266

Filed Mar. 30, 1979, Ser. No. 25,476
Int. Cl.[3] A63H *13/02*
U.S. Cl. 46—123 3 Claims

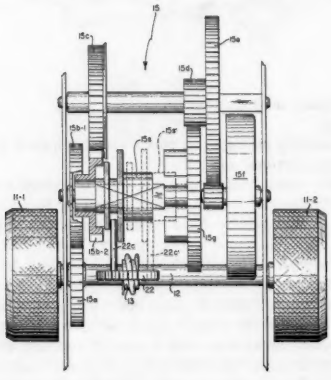


1. A toy including at least two toy weights and shell means movably mounted on base means, said base means including a generally horizontal surface having an opening, means for holding said shell means cocked, weight-actuated means for triggering release of said shell means from cocked position including depressible weight-receiving means mounted in said opening on said base means within reach of said shell means and cocking release means joined to said weight-receiving means, said weight-receiving means being adapted to actuate said cocking release means when a number of said toy weights sufficient to depress said weight-receiving means is placed on said weight-receiving means, and means for moving said shell means forward from cocked position to a position covering said toy weights, and then moving said shell means and covered weights to a position where said toy weights no longer exert force on said weight-receiving means.

4,272,914
ROCKET CAR

Henry Orenstein, Claridge House, Verona, N.J. 07044

Filed Jan. 26, 1979, Ser. No. 6,687
Int. Cl.[3] A63H *29/20, 17/04, 11/10, 13/16*
U.S. Cl. 46—209 8 Claims

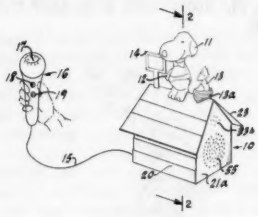


1. A toy device comprising
a chassis with a shaft connected thereto,
an energy source,
means for connecting said energy source to drive said shaft at a first velocity, and
means responsive to the rotation of said shaft for connecting said energy source to drive said shaft at a second velocity, greater than the first, and for operating an auxiliary device; wherein said energy source is a flywheel, the first mentioned connecting means is a gear train, and the second mentioned connecting means is a slider operated by the rotation of said shaft.

4,272,915
AUDIO-VISUAL AMUSEMENT DEVICE

Sidney Noble, Taipei, Taiwan, assignor to Mego Corp., New York, N.Y.

Filed Sep. 28, 1979, Ser. No. 79,661
Int. Cl.[3] A63H *33/26, 11/00*
U.S. Cl. 46—232 9 Claims

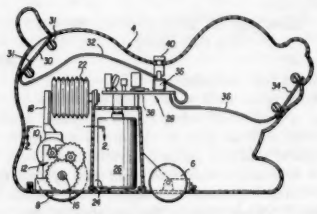


1. An audio-visual amusement device comprising a housing supporting at least one movable animated figure, a mechanical drive mechanism including an electric motor, an audio amplifier, a battery source of electric power, and an elongated control cable, said control cable terminating in a control head including a microphone, a first control switch placing said microphone in circuit with said amplifier, and a second control switch activating the electric motor of said drive mechanism, said drive mechanism including a vertically oriented driven member, said driven member having axial means for activating a first animated figure in each revolution thereof and radial means for activating a second animated figure.

4,272,916
PROXIMITY RESPONSIVE TOY

George P. Giordano; Robert E. Cordrey, and Allen F. Eberts, all of Cincinnati, Ohio, assignors to CPG Products Corp., Cincinnati, Ohio

Filed Dec. 6, 1979, Ser. No. 100,986
Int. Cl.[3] A63H *30/02*
U.S. Cl. 46—253 8 Claims



1. A toy having motor-driven drive means for propelling the same,
electrical sensing circuit means on said toy, including a capacitor plate means for sensing the proximity of said toy to a capacitive body;
and control circuit means responsive to a predetermined

change in capacitance of said sensing circuit means upon close proximity of said capacitive body to said capacitor plate means for initiating operation of said motor for a predetermined period of time;

said drive means being arranged to drive said toy in a forward direction, said capacitor plate means including a plate positioned in a rear region of said toy whereby approach of a capacitive body to said rear region will cause said toy to move in a direction away therefrom; and p1 a further plate positioned in a forward region of said toy whereby approach of a capacitive body thereto will cause said toy to move toward said latter capacitive body and follow any forward movement thereof.

4,272,917

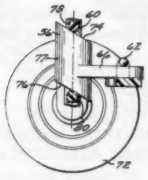
STEERING ASSEMBLY RENDERING CAR UNSTABLE IN A TURN

Jay Smith, III, Pacific Palisades, and Richard L. Malone, Manhattan Beach, both of Calif., assignors to Smith Engineering, Santa Monica, Calif.

Filed Jan. 25, 1980, Ser. No. 115,229

Int. Cl.³ A63H *30/04, 17/36*

U.S. Cl. 46—254 **21 Claims**



1. A steering assembly adapted for incorporation into a toy car and for rendering the toy car unstable in a turn thereby enhancing the play value of the toy car, the steering assembly comprising:

a first kingpin incorporated in a toy car chassis and fixedly connected to a first axle bearing a first wheel;

a second kingpin incorporated in the toy car chassis and fixedly connected to a second axle bearing a second wheel;

first means attached to the car chassis for pivoting the first kingpin and the second kingpin about a respective substantially vertically disposed axis at the option of a player, a pivoting motion of the first and second kingpins being coordinated so as to steer the toy car on a support surface, either one of the first and second kingpins being on the inside and the other kingpin being on the outside of a turn at the steering option of the player, and

second means for lowering the kingpin and the connected wheel positioned on the inside of the turn towards the support surface, and for simultaneously raising the kingpin and the connected wheel positioned on the outside of the turn away from the support surface.

4,272,918

MULTI-POSITION REMOTE CONTROLLING DEVICE FOR TOYS

Tsutomu Inoue, Ichikawa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan

Filed Mar. 19, 1979, Ser. No. 21,639

Claims priority, application Japan, Mar. 30, 1978, 53-41442[U]

Int. Cl.³ A63H *11/00*

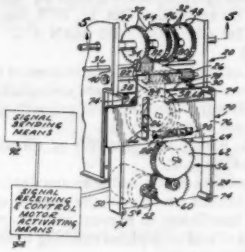
U.S. Cl. 46—266 **17 Claims**

1. In a toy having a plurality of moving parts, and a device for driving and selectively actuating any one of the parts, the device comprising:

a drive motor mounted within the toy, the drive motor rotating a drive gear mounted upon a first axle;

a control gear mounted upon a second axle in the toy and engaging the drive gear, the control gear being movable relative to the drive gear in a direction parallel with the first axle while staying in operative position wherein the drive gear rotates the control gear;

a plurality of output gears, each output gear being fixedly positioned relative to the drive gear for engagement with the control gear in at least one subjectively selected position of the control gear, each output gear driving a predetermined part of the toy;



cam means for continuously moving the control gear relative to the drive gear, the cam means including a cam member and a cam follower connecting piece mounted for movement in the toy parallel with the first axle, the connecting piece moving the control gear, and

motor means for driving the cam means, for as long as the motor means are energized the motor means being subjectively actuable by an operator, the cam means and the control gear being adapted to be left in any position that the cam means and the control gear are occupying at the time the motor means are deenergized.

4,272,919

SEED CARRIER AND METHOD OF PRODUCING SAME

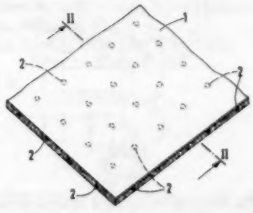
Evald G. Schmidt, Skansgatan 4, Markaryd, Sweden (285 00)

Filed Aug. 2, 1979, Ser. No. 63,142

Claims priority, application Sweden, Jul. 28, 1978, 7808216

Int. Cl.³ A01G *31/00*

U.S. Cl. 47—56 **23 Claims**



13. A method of producing a peat-containing seed carrier on a machine comprising at least one rotating endless forming element and having a drying section comprising the steps of:

(a) adding water to raw peat material to obtain a peat fibre suspension having a peat fibre concentration of less than 1 percent by weight;

(b) feeding the peat fibre suspension to a classifying device;

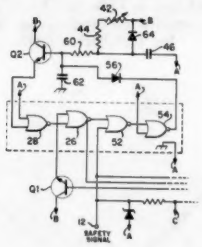
(c) classifying the peat fibre suspension by separating therefrom a portion of colloids and particles of less than 0.2 mm in size;

(d) wet mixing another fibre material with the peat material to interconnect the peat fibres and to form a mixture;
(e) thereafter supplying the mixture to the forming element of the forming machine;
(f) adding seeds to the peat fibre material before the mixture reaches a drying section of the machine; and
(g) thereafter drying the mixture to provide a seed carrier.

4,272,920
METHOD OF APPLYING HERBICIDE
Jean H. Dawson, Prosser, Wash., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.
Continuation-in-part of Ser. No. 907,474, May 19, 1978, abandoned. This application Oct. 11, 1979, Ser. No. 83,694
Int. Cl.³ A01C *1/06;* **A01N** *9/12*
U.S. Cl. 47—58 **20 Claims**

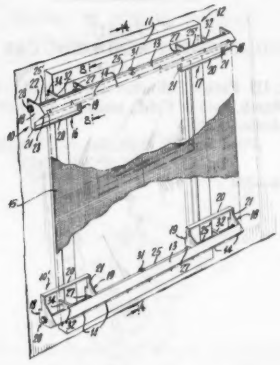
1. A method of applying herbicide to control the growth of undesirable plants among crop plants, comprising
simultaneously introducing into the soil in close proximity, a crop seed and herbicide,
said herbicide having the capability of spreading from the area around the seed,
said herbicide being introduced in an amount sufficient, after spreading thereof, to control the growth of undesirable plants and insufficient to prevent an economically meaningful stand of said crop plants resulting from the germination of said crop seed,
said herbicide being introduced in an amount, before spreading, capable of causing injury to said crop resulting from germination of said crop seed,
said introduction being carried out in the absence of substances which specifically antagonize any harmful action of said herbicide on said crop seed and crop plants resulting from the germination of said crop seed.

4,272,921
TRAFFIC RESPONSIVE CONTROL SYSTEM FOR AUTOMATICALLY OPERATED DOORS
Robert Jorgensen, Niles, Mich., assignor to Kawneer Company, Inc., Niles, Mich.
Filed Dec. 21, 1978, Ser. No. 971,781
Int. Cl.³ E05F *15/20*
U.S. Cl. 49—30 **10 Claims**



1. A traffic responsive control system arranged to control traffic through a door and responsive to the presence of traffic on both the operate and safety sides of the door, comprising means for developing a first control signal in response to the presence of traffic in a predetermined area on the operate side of the door, means for developing a second control signal in response to the presence of traffic in a predetermined area on the safety side of the door, a power switch, means controlled by said power switch for developing power for said control system, means responsive to said first control signal for opening said door, said door opening means also operating in response to the application of power of said control system when said power switch is closed, means for disabling said door opening means when power is initially applied to said control system, thereby to prevent opening of said door in response to closure of said power switch, and means for preventing said disabling means from also responding to said second control signal so that said door can be opened in response to said first control signal substantially immediately after termination of said second control signal.

4,272,922
WINDOW GUARD SUPPORT
Irwin D. Prager, 34 Malone Ave., Staten Island, N.Y. 10306
Filed Jun. 25, 1979, Ser. No. 52,005
Int. Cl.³ E06B *3/68*
U.S. Cl. 49—55 **9 Claims**



1. Window guard supporting means for securing a window guard such as steel mesh, screening and the like in overlying relationship to a window having a surrounding frame comprising at least one support for attachment to said window, said support comprising a pair of spaced brackets, an elongated member extending between and rotatably carried by said brackets, a carrier member extending between and secured to said brackets, said carrier member including means for engaging and supporting said guard, and adjustable means carried by and adjoining each end of said elongated member and movable into engagement with said frame to releasably secure said support to said window frame.

4,272,923
VEHICLE DOOR
Bruce H. Anderson, Centerport, N.Y., assignor to ComCoach Corporation, Ronkonkoma, N.Y.
Continuation-in-part of Ser. No. 932,942, Aug. 11, 1978, abandoned. This application Jul. 20, 1979, Ser. No. 59,567
Int. Cl.³ E05F *11/00*
U.S. Cl. 49—360 **25 Claims**

1. In combination, a mass transit vehicle having a sliding door, comprising upper track means suspended downwardly and resiliently mounted on the upper frame of said vehicle, lower track means extending outwardly and rigidly mounted on the lower frame of said vehicle, lower suspending means mounted on said door and slidingly cooperating with said lower track means, upper guide means mounted on said door and slidingly cooperating with said upper track means, and means for causing said door to move between an open and a closed position along said track means, each of said track means comprising linear bearing rod means affixed to a plurality of spaced apart mounting blocks which, in turn, are secured to said vehicle such that said linear bearing means are essentially parallel to the longitudinal axis of said vehicle, said upper track means comprising an upper track support fixed to the upper frame of said vehicle in a horizontal plane and upper mounting blocks suspended from, and resiliently mounted to,

said upper track support, and said lower track means comprising a lower track support fixed to the lower frame of said

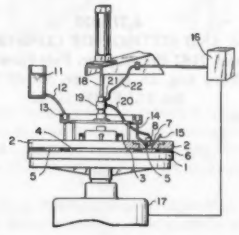
vehicle in a vertical plane and lower mounting blocks extending outwardly from, and rigidly mounted to, said lower track support.

4,272,924

METHOD OF ULTRASONIC CONTROL FOR LAPPING AND AN APPARATUS THEREFOR

Masami Masuko, Tokyo, and Chikanobu Ichikawa, Koshoku, both of Japan, assignors to Fujikoshi Machinery Corporation, Nagano, Japan

Filed Jan. 29, 1980, Ser. No. 116,396
Claims priority, application Japan, Jan. 31, 1979, 54-10024
Int. Cl.³ B24B *49/04*
U.S. Cl. 51—165 R **5 Claims**



1. A method for lapping a thin work piece in a lapping machine having a lower lapping surface plate with an annular lapping surface and an upper lapping surface plate with an annular lapping surface rotating relative to and substantially in parallel with the lower lapping surface plate with said work piece sandwiched therebetween and with a continuous supply of a lapping fluid to the interspace therebetween, which method comprises:

(a) projecting an ultrasonic wave substantially perpendicularly to the surface of the work piece through said lapping fluid and said work piece, said wave passing through an opening provided in a portion of the annular lapping surface of the upper lapping surface plate with an ultrasonic transducer means,

(b) receiving the echo waves of the ultrasonic wave reflected at the upper and the lower surfaces of the work piece with the ultrasonic transducer means whereby the echo waves are converted into electric signals corresponding thereto, and

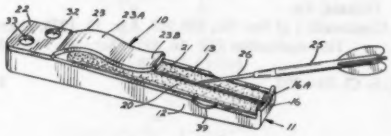
(c) transmitting the electric signals to a control means for the lapping machine where the electric signals corresponding to the delay time of the echo waves are computed in terms of the thickness of the work piece and utilized for controlling the operation of the lapping machine.

4,272,925

SHARPENING APPARATUS

Louis N. Graves, Anoka, Minn., assignor to Louis N. Graves Co., Inc., Anoka, Minn.

Filed Feb. 4, 1980, Ser. No. 117,876
Int. Cl.³ B24B *3/54*; B24D *15/02*
U.S. Cl. 51—211 R **11 Claims**



1. A sharpening apparatus comprising;

a base;

a pair of thin, elongate sharpening rods;

said base having a compartment for storage of the rods in side-by-side relationship in a first position with a surface interface of the rods accesible for sharpening a pointed object;

clip means holding the rods in the compartment;

said base having an end wall partially defining said compartment;

said rods movable to a second position in side-by-side relationship with first ends located in the compartment and retained therein by the clip means, and opposite ends extended over the end wall in cantilever fashion and accessible for use in sharpening pointed articles;

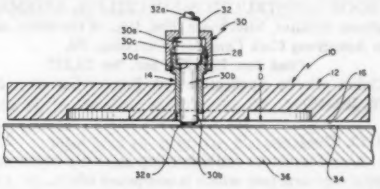
said base having angularly inclined mounting openings for mounting the rods in a third position extended angularly upward in acute angular relationship to the base with each rod leaning in an opposite direction relative to the base.

4,272,926

FACE FINISHING TOOL FOR FIBER OPTIC COMMUNICATION CABLE

Thomas W. Tamulevich, Southbridge, Mass., assignor to Epoxy Technology Inc., Billerica, Mass.

Filed Nov. 5, 1979, Ser. No. 91,076
Int. Cl.³ B24B *41/06*
U.S. Cl. 51—216 R **7 Claims**



1. In a facet finishing tool for a terminated fiber optic communication cable, said tool having a reference surface and having a connector element for selectively positioning and locating such a cable coupled therewith relative to the reference surface, said connector element including a cable-abutting locating surface, the improvement in said tool comprising

a base element of precision cast material forming, as cast,

said reference surface and a mounting passage with selected precise orientation relative to said reference surface,

said connector element being mounted to said base element by adjustable press fit within said passage,

whereby said cast base element provides said reference surface with selected smoothness and with abrasion resistance, and mounts said connector element with selected precise relative orientation and adjustably for the calibration repositioning of said locating surface in said passage relative to said reference surface.

4,272,927

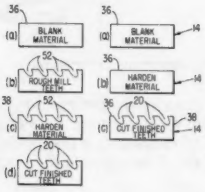
METHOD OF MANUFACTURING A BROACHING TOOL

Julius D. Myers, Lake Orion, and John X. Russell, Troy, both of Mich., assignors to The Babcock & Wilcox Company, New Orleans, La.

Continuation of Ser. No. 895,903, Apr. 13, 1978, abandoned. This application Dec. 10, 1979, Ser. No. 102,205

Int. Cl.³ B24B *1/00*

U.S. Cl. 51—322 **3 Claims**



1. A method of manufacturing a broaching tool comprising the steps of:

providing a blank piece of steel material suitable for manufacturing a broaching tool;

heat treating said steel material to harden it to a Rockwell C hardness substantially in the range of 63.5 to 67 thereby;

grinding a series of gullets directly into the hardened material with a CBN 500 (cubic boron nitride) grinding wheel to form a series of finished broach cutting teeth therein with said grinding with said CBN 500 grinding wheel being done so as to provide the removal of between 0.06 and 0.09 inches of hardened metal per each cyclic pass of said CBN 500 grinding wheel across the surface of said hardened material at a rate of approximately 2 to 6 inches per minute; and

exhausting a synthetic coolant on the face of said CBN 500 grinding wheel at a rate of substantially 30 gallons per minute during the grinding operation.

4,272,928

ROOF CONSTRUCTION-SUBCEILING ASSEMBLY

Wolfram Schlüter, Meerbusch, Fed. Rep. of Germany, assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Jun. 29, 1979, Ser. No. 53,377

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1978, 2833487

Int. Cl.³ E04H *9/00*

U.S. Cl. 52—1 **2 Claims**

1. A roof structure and subceiling assembly consisting of:

(a) a roof structure which is composed of:

(1) a metal deck,

(2) over top of the metal deck there being positioned a heat insulating layer,

(3) over top of the heat insulating layer there being positioned a water impermeable outer layer,

(b) below the roof structure there being positioned a suspended ceiling, said suspended ceiling comprising:

(1) a plurality of suspended support runners,

(2) positioned on the support runners a plurality of ceiling boards,

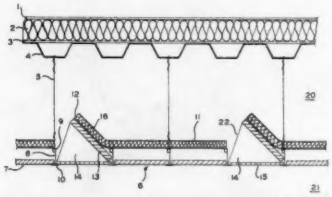
(3) over top of the ceiling boards there being positioned an intermediate heat insulating layer,

(c) the improvement comprising:

(1) a plurality of ventilation openings in the suspended ceiling providing for air passage from the area below the suspended ceiling into the area above the suspended ceiling between the suspended ceiling and roof structure,

(2) said ventilation openings being capable of being closed by a fire barrier, said fire barrier comprising:

(a) a ceiling board sized to fit within the ventilation opening and having one edge of the ceiling board



resting on a support runner in a diagonal position so that the opposite edge of the ceiling board is raised above the plane of the suspended ceiling, said ceiling board being supported in position by a supporting member of a material which will melt, decompose, or otherwise lose its rigidity under the influence of heat so that, after the decomposition of said supporting member, said ceiling board, together with the overlying intermediate layer of heat insulation material will fall into position substantially closing the ventilation opening with ceiling board in position in the plane of the suspended ceiling and the overlying intermediate layer of insulation being placed in position over top of the ceiling board.

4,272,929

TOWER AND METHOD OF CONSTRUCTION

Bror H. Hanson, 7182 Broadbridge, Fair Haven, Mich. 48023

Filed Aug. 23, 1979, Ser. No. 69,120

Int. Cl.³ E04H *12/00*

U.S. Cl. 52—40 **1 Claim**

1. A wind powered generating tower comprising in combination:

a plurality of tubular sections, including a lower section to

be anchored by cement in a hole in the ground and a higher section slideable within and atop the lowest section;

the distance the higher section slides within the lowest section predetermined by a ring shaped member attached around the exterior of the higher section where the ring abuts the top of the lowest section;

the lowest section including pairs of set screws positioned around its top so that by tightening selective screws the higher section may be placed at an angle relative the lowest section and where the sections are locked together by the tightening of said set screws;

the lowest section further including a U-shaped member where the tops of the sides of the U-shaped member are joined to the lowest section and the base of the U rests on the bottom of the hole so to enable the anchoring cement poured around the lowest section to flow past the U-shaped member into the interior of the lowest section;

each of said sections having staggered nuts welded to the exterior of the tower for holding ladder legs which enable climbing of the tower; and

a wind tubine generator pivotably connected atop the highest section.

4,272,930

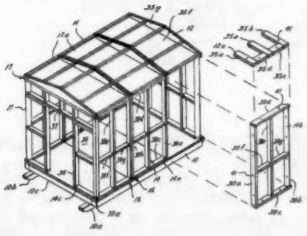
MODULAR HOUSING SYSTEM

Manford H. Foster, Houston, Tex., assignor to Roy H. Smith, Jr., Bellaire, Tex.

Continuation of Ser. No. 628,468, Nov. 4, 1975, abandoned. This application May 30, 1978, Ser. No. 910,575

Int. Cl.³ E04H *12/14*

U.S. Cl. 52—79.1 **8 Claims**



1. In a modular housing system which includes a number of wall panel units disposed in line and abutting one another to form a wall and connector means extending between abutting frame members of such wall panel units, said connector means including:

a pin extending through aligned openings in adjacently positioned frame members of adjacently positioned wall panel units;

said pin having an end portion extending outwardly of said adjacently positioned frame members, said end portion having a pair of oppositely positioned slots;

a lock plate having an opening wherein to receive said pin end portion, said lock plate being positioned against said frame member from which said pin end portion extends outwardly; and

a wedge member mounted onto said pin end portion for engaging said pair of oppositely positioned slots;

said wedge member being movable between a released position and a wedge position in which said wedge member is wedged against said lock plate and said pin end portion, holding said pin in tension to attach said adjacent frame members to each other;

said lock plate and wedge member having serrated portions which intersect to lock said wedge member in said wedged position, both said serrated portions being spaced from their respective opening portions engaging said pin end for separation of the wedge member from the lock plate by lifting up on the end of the wedge member adjacent its serrated portion.

4,272,931

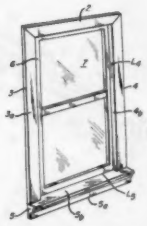
PREFABRICATED SHELL ASSEMBLY FOR WINDOW TRIM

John A. Stanizzo, 430 Fernhill Ave., Pittsburgh, Pa. 15226

Filed May 21, 1979, Ser. No. 40,764

Int. Cl.³ E06B *7/12*

U.S. Cl. 52—98 **5 Claims**



1. A shell assembly comprised of trim members for the interior surrounds of a substantially rectangular window opening, said trim members being joined together so as to form the trim facing for said window; each such trim member being comprised of (i) an elongated casing section having an interior surface adapted for attachment to the wall surrounding said window opening, the inner longitudinal edge of said casing section being joined with and substantially perpendicular to (ii) an elongated border section, having a length commensurate with the length of said casing section and a width of from about ¼ to 6 inches, the interior surface of said border section being adapted for attachment to the jamb surface which is perpendicular to the plane of the wall and to the plane of the window, a major portion of said interior surface having longitudinal grooves therein, said grooves being parallel to each other and to the free longitudinal edge of said border section, and being spaced from each other a distance of about ¼ to ½ inch, permitting said width readily to be modified to correspond with the depth between the wall and the window rail, so as to fit properly therebetween when said trim member is attached to the wall, wherein the border section of at least one of said side trim members has an interior surface constructed to provide at least one approximately longitudinal channel between said interior surface and said jamb surface, in which a portion of said channel near one end thereof can be connected to a source of air under a pressure greater than ambient, while another portion near the other end thereof connects to an aperture penetrating the thickness of said border section at an acute angle thereto, whereby air flowing through said channel and said aperture will be caused to flow over the inner surface of the window and prevent condensation thereon.

4,272,932

TELESCOPIC BOOM

Joachim H. R. Wappler, 317 Kenollie Rd., Mississauga, Ontario, Canada

Filed May 16, 1978, Ser. No. 906,661

Int. Cl.³ E04H *12/34*

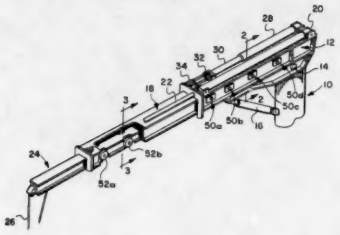
U.S. Cl. 52—118 **3 Claims**

1. A telescopic boom for a hoist such as a truck mounted hoist or the like, having a column portion, a fixed boom section mounted on said column portion, a telescopic boom section slidably received within said fixed section, a trolley section slidably received within said telescopic section, wherein the improvement comprises:

two parallel I beam members fastened together in side by side relationship and forming said telescopic section, each

of said I beam members comprising a central web portion and upper and lower flanges extending outwardly therefrom on either side of said web portion, and said flanges having generally planar surfaces thereon lying in a plane at an obtuse angle relative to the plane of said web portion;

wheel members mounted in an inwardly facing manner on said fixed boom section, and engaging opposite said I



beam members on their outwardly directed sides, and further wheel members on said trolley section, facing outwardly with respect to and engaging said I beam members on their inwardly directed sides;

rims on said wheel members engageable with said I beam members for guiding telescoping movement, and,

tapering, convexly curved tread surfaces on said wheel members engaging said generally planar surfaces of said flanges in an essentially tangential manner.

4,272,933

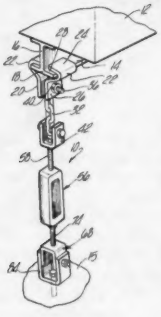
MOBILE HOME ANCHOR

Rosario Lopes, 19266 Berden Ave., Harper Woods, Mich. 48225

Filed Apr. 16, 1979, Ser. No. 30,272

Int. Cl.[3] E02D *27/32, 5/74*

U.S. Cl. 52—149 **5 Claims**



1. An anchor for detachably securing a mobile home to and above a base, said mobile home having an underframe, said anchor comprising:

a clamp member,

first means for attaching said clamp member to the mobile home underframe,

an elongated connecting member secured at one end to the clamp member,

a first clevis having a base and a pair of outwardly extending legs,

means for securing said first clevis to the other end of said connecting member so that the legs of the first clevis extend upwardly toward said mobile home underframe,

a second clevis having a base and a pair of outwardly extending legs, a pair of registering apertures being formed through the outwardly extending legs of the second clevis,

means for attaching said second clevis to said base so that the base of the second clevis flatly abuts against said base and so that the legs of said second clevis extend upwardly,

a third clevis having a base and a pair of outwardly extending legs, each leg having an aperture formed through it so that said apertures register with each other, the outside width of the legs of the third clevis being less than the inside width between the legs of the second clevis,

means extending through the apertures in the legs of said second and third clevis for pivotally securing said second and third clevises together so that the legs of the third clevis extend downward, and

tension means for attaching the bases of the first and third clevises together,

wherein all of said clevises are of a one-piece construction.

4,272,934

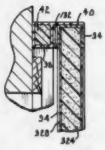
PANEL STRUCTURE FOR BLOCKING WINDOWS

Ernest A. Cowden, Kansas City, and Leo E. Lauber, Eudora, both of Kans., assignors to The Clear Corporation, Eudora, Kans.

Continuation-in-part of Ser. No. 846,416, Oct. 28, 1977, abandoned. This application Jan. 26, 1979, Ser. No. 6,686

Int. Cl.[3] E06B *3/28*

U.S. Cl. 52—202 **4 Claims**



1. A panel structure for blocking a glass pane, said panel structure comprising:

a rigid framework of thermally insulating material, said framework extending on all sides of said glass pane;

a plurality of panel sections each constructed of a rigid thermally insulating material adapted to substantially prevent the passage of light therethrough, said panel sections having adjacent edges and each presenting opposed substantially flat surfaces, the ends of said panel sections being exposed under said sheet whereby said sections may be trimmed to a desired size;

a flexible sheet coupled with both panel sections along two aligned flat surfaces to hingedly couple said sections together, the adjacent edges of said sections being exposed beneath said sheet whereby when said flat surfaces are aligned said edges are is abutting relationship, said sheet being foldable to provide a hinge axis about which said sections may be moved to a folded position; and

means for coupling said panel sections with said framework to thereby hold said sections in a pane blocking position.

4,272,935

FIELD-INSTALLED INSULATION AND APPARATUS FOR AND METHOD OF MAKING AND INSTALLING THE SAME

Sidney Lukas, East Meadow; Timothy E. Golden, Islip; Patrick J. Lunarola, Massapequa, and Michael G. Mard, Bohemia, all of N.Y., assignors to Retro-Flex, Inc., Hempstead, N.Y.

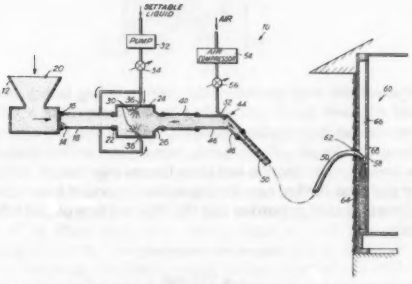
Filed Feb. 19, 1980, Ser. No. 122,200

Int. Cl.[3] E04B *2/34;* **B29D** *27/00*

U.S. Cl. 52—309.11 **25 Claims**

1. Method of making thermal insulation in closed cavities of field structures, comprising the steps of:

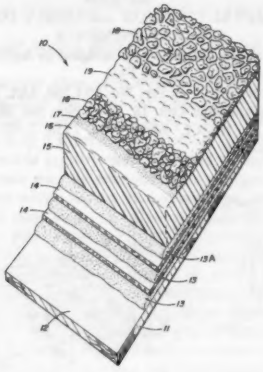
(a) conveying a carrier air stream under pressure along a path to a wetting chamber;
(b) introducing a multitude of individually pre-formed, foamed plastic particles into the carrier air stream for entrainment in the stream;
(c) substantially wetting the carrier-entrained particles by applying a settable film-forming liquid substance thereto in the wetting chamber to form a liquid-drenched dense but flowable mixture of said multitude of particles;
(d) pulling the drenched particles out of the wetting chamber in a second air stream, said conveying step and said pulling step jointly constituting a push-pull step; and
(e) flowing the drenched particles in a second air stream via a filler hose to the closed cavities,
said settable substance setting and forming a set film which covers and adheres said particles to one another at their common points of contact to form a structural thermally-insulating dense mass of said particles at the cavities,
said structural thermally-insulating mass being structurally stable and resistant to disassociation of said individual particles due to the adhesion-like characteristic of said set film which provides structural integrity to the entire thermally-insulating mass.



11. A thermally-insulating, non-flammable, air-permeable insulation installed in a field structure, said insulation being made and installed by the method of claim **1**, said insulation comprising:
a multitude of individually pre-formed, foamed plastic, thermally-insulating particles; and
a set film formed from a settable, film-forming, initially-liquid, non-flammable substance,
said set film covering and adhering said particles to one another at their common points of contact to form a structural dense mass of said multitude of particles,
said mass being structurally stable and resistant to disassociation of said individual particles due to the adhesion-like characteristic of said set film which provides structural integrity to the entire mass,
said mass being resistant to fire due to the non-flammable characteristic of said set film which covers said particles,
said mass having interstices bounded by said particles themselves at those points which are other than said contact points, and
said interstices being air passageways which permit vapors on one side of the mass to pass through towards the other side of the mass in order to permit the entire mass to vent vapors therethrough.

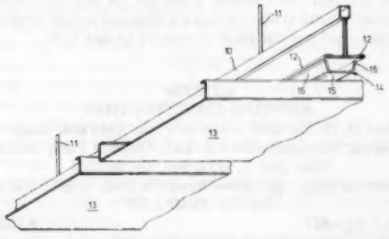
4,272,936
INVERTED ROOF SYSTEM
Orland H. Bonaguidi, 1363 Cottontail La., La Jolla, Calif. 92037
Filed Jan. 2, 1979, Ser. No. 332
Int. Cl.³ E04B *5/00*
U.S. Cl. 52—309.12 **5 Claims**

1. An inverted roof structure of reduced weight and enhanced insulative, protective, and fire retardant qualities, which comprises:
(a) roof support means;
(b) a roof deck secured to said roof support means;
(c) a water impermeable membrane affixed to the exposed outer surface of said roof deck;
(d) a sealant-adhesive coat disposed over said membrane;
(e) a thermal-insulation layer comprised of closed-cell plastic foam secured to said membrane by means of said sealant-adhesive coat;



(f) a toothing surface secured upon said thermal-insulation layer; and
(g) a substantially water-impermeable insulative-protective layer uniformly disposed upon toothing surface in the amount of at least about 50 pounds per 100 square feet of surface area and secured thereto, said insulative-protective layer being formed from an admixture substantially comprising unset white cement, water, perlite fines, finely divided clay and lime, a thickener, a vinyl acrylic polymer, and magnesium silica flour.

4,272,937
PANEL CONSTRUCTION
Johannes Antonius H. Brugman, Rotterdam, Netherlands, assignor to Hunter Douglas International N.V., Curaco, Netherlands Antilles
Filed Nov. 16, 1978, Ser. No. 961,265
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1977, 2752963; United Kingdom, May 26, 1978, 23416/78
Int. Cl.³ E04B *5/52*
U.S. Cl. 52—483 **11 Claims**



1. A panel construction comprising a plurality of mutually parallel elongate support members, each having two parallel free longitudinal edges spaced apart from one another, elongate support elements carried by said support members, said

support elements having their length aligned with and parallel to the length of said support members, a bracket means connecting adjacent support elements to maintain a predetermined spacing between said support elements, clamping means engaged around the longitudinal edges of the support members for pressing said support elements against said support members, a plurality of panel holding means on each support element and a plurality of panels held by said panel-holding members.

4,272,938

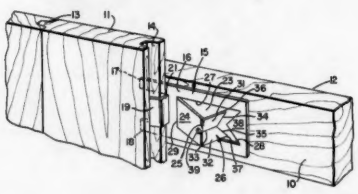
SHEET METAL CLIP FOR ASSEMBLY OF BUILDING COMPONENTS

Andrew G. Seipos, Miami, Fla., assignor to Automated Building Components, Inc., Miami, Fla.

Continuation-in-part of Ser. No. 953,760, Oct. 23, 1978. This application Oct. 18, 1979, Ser. No. 86,132

Int. Cl.³ E04B *1/38, 1/58, 1/60*

U.S. Cl. 52—509 **10 Claims**



1. A clip for attaching together wooden or like members consisting of a one-piece sheet metal element having a thin flat base adapted to be seated on one of said members and provided along one edge with an outwardly open socket-like formation consisting of metal displaced from said base and disposed above a surface of said base for abutting engagement with the other of said members, a bent nail formed by material displaced out of said base to leave an opening in said base and comprising a shank portion extending at an acute angle from a hinge along an edge of said opening away from the opening of said socket-like formation and away from said base surface and said opening and a tip portion extending from a transverse bend parallel to said hinge back toward said opening and being adapted to angularly penetrate said one member, the included angle between said shank and tip portions being an acute angle, and said tip being longitudinally bifurcated with the free ends of the bifurcation having oppositely laterally outwardly and downwardly inclined edges that terminate in relatively sharp points, whereby when said shank is bent about said hinge to drive said tip portion into said one member the clip is biased to more closely abut said socket with said other member while at the same time said bifurcations are caused to automatically diverge laterally outwardly so that when the shank of the nail enters into the base opening it lies flat on said one member while the imbedded bifurcations are disposed in both longitudinal and lateral angular relation relative to said base.

4,272,939

JOINTING CONSTRUCTION

Michael O. H. Herzfeld, Osborne Park, Australia, assignor to Producer Manufacturers Pty. Ltd., Osborne Park, Australia

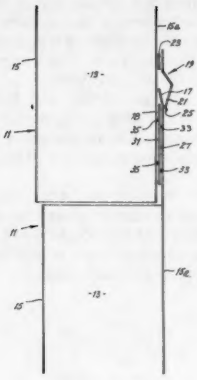
Filed Dec. 7, 1978, Ser. No. 967,354

Claims priority, application Australia, Dec. 7, 1977, PD2697

Int. Cl.³ E04D *1/00*

U.S. Cl. 52—527 **6 Claims**

1. A jointing construction for laminated panels of the type having a core lamination of heat insulating material and facing sheet laminations bonded to opposed sides of the core, the jointing construction being characterized in that one of said panels is formed with one side edge portion of one facing sheet extending beyond the core lamination to define a projection, the adjacent side edge portion of the facing sheet of the adjacent panel having an engaging member associated therewith, the engaging member having engaging means spaced from the respective facing sheet to define a gap therebetween, the pair of said panels in use being disposed adjacent each other with the projection of one panel engaged by the engaging member of the other panel and retained in said gap, and sealing means provided between said projection of said one panel and the



adjacent side edge portion of the corresponding facing sheet of said adjacent panel, said sealing means comprising a tubular seal formed from resilient material, said tubular seal extending along the length of the joint, non-drying sealant provided between said projection and the adjacent side face of the tubular seal, and further non-drying sealant provided between said adjacent side edge portion and the adjacent face of said tubular seal.

4,272,940

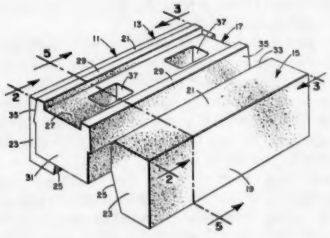
INTERLOCKING BUILDING BLOCK

Ted Nicolls, Rte. 2, Newcastle, Wyo. 82701

Filed Mar. 7, 1979, Ser. No. 18,169

Int. Cl.³ E04B *2/18*

U.S. Cl. 52—592 **9 Claims**



1. A building block adapted to interfit with similarly shaped blocks when assembled into a structure, said block comprising: a central body portion and a pair of side body members disposed on either side of said central portion; vertically extending tongue means extending from the upper surface of said central body portion; groove means formed by the bottom of the central body portion and the inner surface of said side body member; a male member projecting from one end of said block; and a flared female recess means in the opposite end of said block for the receipt of the male member of an adjacent block, the interior surfaces of said side body members forming the interior walls of said female recess being horizontally tapered

inwardly, said flared female recess being the widest at its external orifice and narrower at the innermost portion of the recess, whereby the horizontal alignment and interfitting of the male member and female recess of adjacent blocks is enhanced when building a course or wall.

4,272,941

THERMALLY-INSULATING CONNECTING ELEMENTS FOR COUPLING TWO COMPONENT PARTS, AND ALSO COMPOUND, THERMALLY-INSULATING PROFILE MEMBERS AND A PROCESS FOR THEIR MANUFACTURE

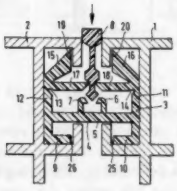
Wilhelm Hasselbacher, Neustadt, and Wolfgang Schalm, Munich, both of Fed. Rep. of Germany, assignors to Annemarie Hasselbacher, Neustadt, Fed. Rep. of Germany

Filed Apr. 3, 1978, Ser. No. 893,000

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1977, 2714999; Apr. 4, 1977, 2715010

Int. Cl.³ E04C *3/30*

U.S. Cl. 52—731 **23 Claims**



1. A thermally-insulating connecting device intended for the coupling of two components and comprising a resiliently deformable connecting element which is insertable into receiving channels on the components, said connecting element being shaped for engagement within said receiving channels as a result of its shape and, after having been inserted into said receiving channels, being adapted to be changed in its dimensions by inserting a locking element so that a connection of the components is formed by resiliently deforming said connecting element by means of said locking element, to urge said receiving channels, said connecting element comprising internal extension arms forming connecting triangles, whereby the extensions push against internal surfaces of the components when the extension arms are actuated by the locking element, to draw the two components together, said extension arms having the shape of a continuous ridge with catching devices fitted to the underside thereof, said continuous ridge comprising a standardized breaking point which may be broken upon insertion of the locking element.

4,272,942

METHOD AND APPARATUS FOR CUSTOM CLOSING OR MODIFYING BUILDING OPENINGS

Edward L. Jackson, 215 Terrace Dr., Pauls Valley, Okla. 73075

Filed Apr. 11, 1977, Ser. No. 786,079

Int. Cl.³ E06B *3/26*

U.S. Cl. 52—741 **3 Claims**

1. A method for sealing an opening in a building comprising:

fastening to, and in contact with, a structure which defines the opening, a plurality of first magnetic strips containing a plurality of magnets, with adjacent magnets so positioned as to have alternate poles thereof facing towards a surface of each of said first strips opposite a surface of each of said first strips which is in contact with the structure which defines the opening, said first magnetic strips being positioned in a course extending around the entire outer periphery of the opening;

closing said opening by positioning a first glass pane thereacross;

positioning, upon a second glass pane, a second magnetic strip containing a plurality of magnets so that the magnets in said second strip are positioned to align poles thereof with at least some of the unlike poles of the magnets in said first magnetic strips when said second strip is superimposed over at least one of said first strips and in registry therewith;

fastening, to said second glass pane, said second magnetic strip; and

placing said second glass pane over the opening and in a plane spaced from the plane occupied by said first glass pane to define air space between said glass panes so that said second strip is superimposed over at least one of said first strips and in registry therewith, and so that said second glass pane may be removed from engagement with the structure which defines the opening by twisting the second glass pane about an angle within the plane of the second glass pane whereby at least one first magnet of said plurality of said magnets in said second magnetic strip will be moved from a position adjacent an unlike pole of at least one magnet in said plurality of magnets in at least one of said first magnetic strips to a position adjacent a like pole of a third magnet of said plurality of magnets in one of said first magnetic strips, whereby a repulsive force will be generated between said first and third magnets, thereby urging the closure panel out of engagement with the structure which defines said opening.

4,272,943

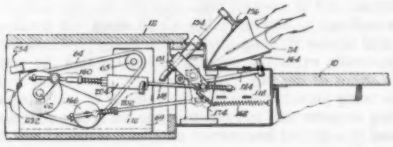
ENVELOPE PROCESSING MACHINE AND METHOD

Robert J. Russell, Camden, N.J., assignor to Mail-Ex Corporation, Skokie, Ill.

Division of Ser. No. 801,454, May 31, 1977, Pat. No. 4,159,611, which is a continuation-in-part of Ser. No. 707,723, Jul. 22, 1976, abandoned. This application Oct. 26, 1978, Ser. No. 955,134

Int. Cl.³ B65B *43/30*

U.S. Cl. 53—492 **5 Claims**



1. A method for opening a sealed envelope having opposing planar sides and exposing the contents thereof for manual removal comprising the steps of:

stacking sealed envelopes to be opened,

removing an envelope from the stack and transmitting the removed envelope from the stack with its planar sides in a substantialy horizontal plane to a cutting means,

severing one edge of said envelope,

transmitting the envelope from the cutting means with said sides in said substantially horizontal plane to an opening means,

thereafter applying suction forces to aid opposite sides of said envelope while said sides are in said substantially horizontal plane,

thereafter maintaining said suction forces on said opposite sides of said envelope and contemporaneously translating said suction forces and moving said suction forces upwardly and apart to move the opposite sides of said envelope apart and to upwardly incline said sides from said substantially horizontal plane to thereby incline said enve-

lope at an angle to said substantially horizontal plane with the severed edge facing upwardly,

and thereafter holding said envelope open for manual removal of envelope contents.

4,272,944

APPARATUS FOR CONTINUOUSLY WRAPPING SUCCESSIVE ARTICLES UNDER VACUUM IN HEAT-SEALABLE FILM

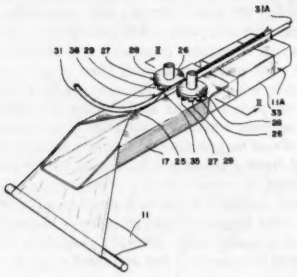
Tadoru Suga, 5-5 Shinchujo-cho, Ibaragi-shi, Osaka-pref., Japan

Filed Mar. 23, 1979, Ser. No. 23,321

Claims priority, application Japan, Sep. 19, 1978, 53/128777[U]; Oct. 24, 1978, 53/146824[U]

Int. Cl.³ B65B *31/04*

U.S. Cl. 53—511 **5 Claims**



1. In packaging apparatus of the type wherein a continuous length of thin flexible heat-sealable film and a succession of articles to be enclosed in said film are introduced into an elongated generally tubular film forming guide means for progressively wrapping the film around the respective opposite sides of the articles to bring the respective side margins of the length of film together to be heat-sealed along their lengths, said apparatus including means to subject the space enclosed by said film during said wrapping to the influence of a source of vacuum, the improvement which comprises means to heat seal said respective side margins of the film together along a continuous line, and means to position an inlet means for said source of vacuum out of contact with said articles and within the space enclosed by said film when sealed along said continuous line, said tubular forming guide means being provided with a longitudinally extending opening through which the respective margins of the film exteriorly project, said heat sealing means being provided adjacent the exterior of said elongated opening to press said margins together on a first continuous line and on a second intermittent parallel line spaced inwardly from the first line, said inlet means for the vacuum source being positioned exteriorly of said forming guide means and within the enclosure defined by said first and second lines of sealing, the intervals in the intermittent second line of sealing providing communication between said inlet means and the space occupied by said articles.

4,272,945

PROCESS AND APPARATUS FOR THE PRODUCTION OF A GUARANTEE CLOSURE

Albert Obrist, Alte Therwilerstrasse 12, 4153 Reinach, Switzerland

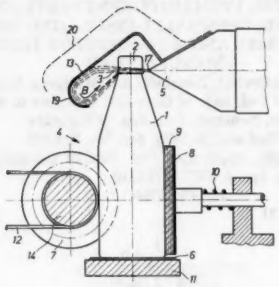
Filed May 17, 1979, Ser. No. 39,967

Claims priority, application Switzerland, May 17, 1978, 5316/78

Int. Cl.³ B65B *7/28, 53/06*

U.S. Cl. 53—557 **6 Claims**

1. Apparatus for the simultaneous and continuous production of a guarantee closure on a multiplicity of containers with closure caps each having a guarantee strip of plastics material separable along a desired tear line, said strip being positively shrink fitted on to the neck of the associated container by heating, comprising transport means for transporting the containers in a row along a predetermined feed path and for simultaneously rotating the containers about their own axes, at least one assembly for producing a flow of hot gas, provided along the feed path, a slot-like nozzle of said assembly disposed approximately at the level of the plane of movement of the



guarantee strips, the outlet opening of said nozzle being directed toward the guarantee strips on said containers as they are moved therepast continuously in a row, while rotating about their own axes to thereby direct the hot gas against the guarantee strips, and a deflector for receiving hot gas from said nozzle after the hot gas has passed the guarantee strips and redirecting it back onto the region of the guarantee strips on the side opposite the nozzle.

4,272,946

MOBILE HAMMER-MILL

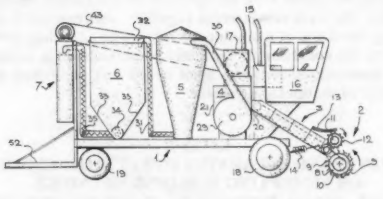
Jack Maher, "Shangrilah", North Condobolin Rd., Forbes, New South Wales, 2871, and Grosvenor F. Francis, Berowra, Leadville, via Dunedoo, New South Wales, 2744, both of Australia

Filed Jun. 6, 1979, Ser. No. 45,877

Claims priority, application Australia, Mar. 2, 1977, FC9258; Mar. 2, 1978, 33803/78

Int. Cl.³ A01D *55/26*

U.S. Cl. 56—13.5 **3 Claims**



1. A mobile meal-production means comprising, in combination, a self-propelled wheeled vehicle having a chassis which supports:

a hay pick-up reel;

a conveyor;

a hammer-mill;

a cyclone device;

a first vertically-disposed auger;

a holding hopper;

a second vertically-disposed auger; and

a single-column screw bagger;

said hay pick-up reel being positioned adjacent ground level in communication with an input region of said conveyor, the output of which communicates with the input of said hammer-mill, the output of said hammer-mill feeding said

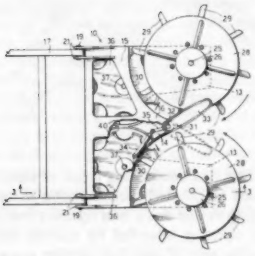
cyclone device, the output of said hammer-mill being connected with said first vertically-disposed auger at its lower end, the upper end of said auger feeding said holding hopper, the output of said hopper being lower than its input and being connected to said second vertically-disposed auger at its lower end, and the upper end of said second auger, in turn, feeding said single-column screw bagger.

4,272,947

TOPPING CUTTER FOR A CANE HARVESTER

Joseph M. Mizzi, Halifax Rd., Ingham, Queensland, Australia (4850)

Filed Oct. 5, 1979, Ser. No. 82,334
Int. Cl.³ A01D *45/10*
U.S. Cl. 56—63 **4 Claims**



1. A topping cutter for a cane harvester including:
a frame,
means for mounting the frame in a vertically adjustable manner on a cane harvester,
a pair of adjacent counter-rotatable feed means mounted at the front of the frame, adapted to engage and feed between them the tops of cane stalks as the harvester advances,
a rotary cutter positioned below and substantially behind each feed means and adapted to coact therewith to sever the tops of cane stalks,
the two sets of feed means and coacting cutter being adapted to eject several tops of cane stalks to opposite sides of the frame,
deflector means pivotally mounted on the frame, and means for moving said deflector so as to direct cane tops selectively to either set of coacting feed means and cutter, and
hydraulic motors for separately driving said cutters and said feed means in opposite directions, said motors being connected in series so as to permit reversal of the directions of rotation thereof to clear trash from the area above the cutters and below said feed means.

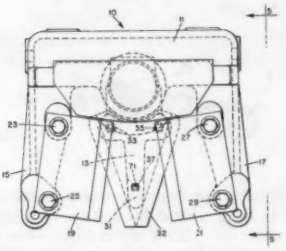
4,272,948

OSCILLATING KNIFE CUTTING APPARATUS

Dale R. Dolberg, Hedrick, and Jack L. Guiter, Ottumwa, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Aug. 13, 1979, Ser. No. 66,138
Int. Cl.³ A01D *55/00*
U.S. Cl. 56—246 **12 Claims**

1. A cutting apparatus comprising:
(a) a main support comprising at least an arm;
(b) at least one main knife fixed to said arm and defining a first plane;
(c) a bearing fixed to said support;
(d) a shaft rotatably mounted in said bearing;
(e) a secondary support, said support comprising a clamp slidably mounted on said shaft;
(f) a secondary knife fixed to said secondary support and defining a second plane parallel to said first plane, one of said secondary and main knives movable relative to the other for severing material disposed between said secondary and main knives; and
(g) means for adjusting the position of one of said second knife and said main knife in a direction perpendicular to



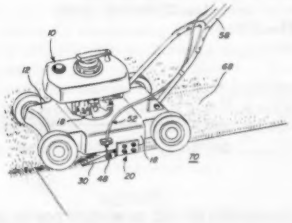
said first plane, said adjusting means comprising a member threadably mounted in said shaft, movable longitudinally of said shaft and engageable with said clamp for sliding said clamp along said shaft by rotation of said member.

4,272,949

ROTARY LAWN MOWER EDGING ATTACHMENT

Gerald N. Franks, and Mae P. Franks, both of P.O. Box 4954, Greenville, Miss. 38701

Filed Feb. 7, 1980, Ser. No. 119,464
Int. Cl.³ A01G *3/06*
U.S. Cl. 56—255 **7 Claims**



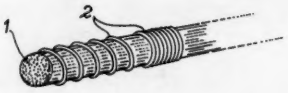
1. In combination with a rotary lawn mower of the type including a downwardly opening wheeled housing in which a powered rotary cutting blade assembly is journaled for rotation about a vertical axis and with said housing including opposite side and front and rear end portions, a mount supported from one side of said housing intermediate the front and rear portions thereof, an elongated narrow ramp member including an elongated longitudinal upper surface, said ramp member extending in a front to rear direction relative to said housing and having its rear end portion pivotally supported from said mount for angular displacement of said ramp member between a lowered operative position with said upper surface forwardly and downwardly inclined and a raised operative position with said upper surface generally horizontally disposed, said upper surface including an inner side marginal edge portion underlying the outer periphery of the adjacent portion of the circular path through which the radial outermost portions of said blade assembly swing, and positioning means operatively connected between said ramp member and housing for releasably retaining said ramp member in said operative and inoperative positions.

4,272,950

FILIFORM TEXTILE MATERIAL

Bruno Bompard, Villeurbanne, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 7, 1978, Ser. No. 967,492
Int. Cl.[3] D02G 3/36
U.S. Cl. 57—232 11 Claims



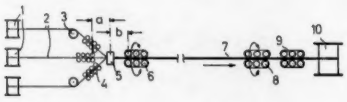
1. A filiform and flexible primary textile strand which is capable of being wound for storing with adjacent turns in direct contact one relative to the other before being used and which is capable of being woven, wherein said textile strand comprises at least one assembly of continuous chemical individual filaments covered by a thread of continuous chemical filaments around said assembly of individual filaments in the form of a helix, said strand having a substantially circular cross-section, said thread of continuous filaments forming an outer surface with protuberances and hollows, said assembly of individual filaments being preimpregnated with a nonpolymerized resin and said thread of continuous filaments being not impregnated with resin.

4,272,951

APPARATUS FOR THE SZ TWISTING OF POWER CABLE CONDUCTORS WITH SECTOR-SHAPED CONDUCTOR CROSS SECTION

Dieter Vogelsberg, Coburg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jul. 20, 1979, Ser. No. 59,194
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1978, 2833704; May 22, 1979, 2921092
Int. Cl.[3] H01B 13/04
U.S. Cl. 57—293 7 Claims



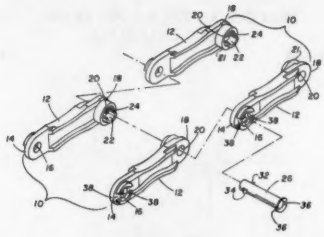
1. In apparatus for the SZ twisting of power cable conductors with a sector-shaped conductor cross section, including:
stationary conductor supplies,
a first twisting closer and a stationary positive guide for each cable conductor arranged in front thereof; and
a second twisting closer;
two twisting devices arranged between the twisting closers, and associated respectively with the two twisting closers;
means to cause said twisting devices to revolve synchronously with changing rotary motion; and
a pulling-off and winding-up device, the distance between the first twisting closer and the first point of engagement of the first twisting device being equal or approximately equal to the distance between the last point of engagement of the second twisting device and the second twisting point, the improvement comprising:
the twisting devices being arranged immediately after and immediately ahead of their respective twisting closers; and
the distance between the last point of engagement of each positive guide at a cable conductor and the first point of engagement of the first twisting device at the material to be twisted being smaller than or at most equal to the length of lay of the material to be twisted given by the pulling off velocity and the speed of revolution of the twisting device, and preferably smaller than or at most equal to one half the length of lay.

4,272,952

PLASTIC CHAIN AND TUBULAR LINK PIN

Richard B. Graham, Columbus, Ohio, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed May 8, 1979, Ser. No. 37,185
Int. Cl.[3] F16G 13/06
U.S. Cl. 59—84 18 Claims



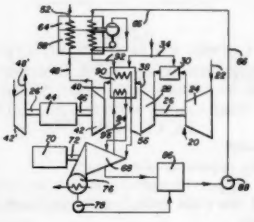
1. Plastic chain link comprising a pair of separate facing link sections formed of molded thermoplastic material, each link section including in one end a first opening and in the opposite end a second opening bounded by mating means extending outwardly on the side of each link section toward like mating means on the other link section for abutting engagement thereof to provide a predetermined space between the links at said one end and indexing means cooperating with the mating means for rigidly joining the separate link sections together at said opposite end and aligning the first openings of each section and the second openings of each section respectively to form a unitary link, said predetermined distance sufficient to accommodate at least a portion of the like joined opposite ends of an adjacent similarly-shaped link so that the first aligned openings of each link can be aligned with the second aligned openings in the adjacent link to receive pin means for coupling the two links together.

4,272,953

REHEAT GAS TURBINE COMBINED WITH STEAM TURBINE

Ivan G. Rice, P.O. Box 233, Spring, Tex. 77373

Filed Oct. 26, 1978, Ser. No. 954,838
Int. Cl.[3] F02C 6/18
U.S. Cl. 60—39.04 16 Claims



1. A process for production of useful power comprising the following steps:
(a) generating in a gas generator means a high temperature, high pressure first gas from ambient air and gas generator fuel without the use of intercooling:
(b) reheating said first gas in a reheat combustor by injection

and ignition of reheater fuel to form a high temperature, high pressure second gas;

(c) driving with said second gas a power turbine for generation of useful power in a first generating means and production of an exhaust third gas;

(d) exchanging heat in heat exchange means for said third gas with liquid water for generation of steam for production of useful power in a second generating means by a steam turbine, said gas generator means comprising a generator turbine drivingly connected by a generator shaft to a turbine gas compressor, said compressor receiving said ambient air for producing high pressure air and discharge thereof into a first combustor, said first combustor receiving said gas generator fuel and forming a combustion gas for driving said generator turbine, said generator turbine driving said compressor and forming said first gas for discharge to said reheat combustor, wherein the pressure ratio of said high pressure air to said ambient air is at least about 18 and said combustion gas is formed at a temperature of at least about 2000° F., and wherein said heat exchange means comprises an evaporator and an economizer, said evaporator receiving said third gas for transfer of heat therefrom to produce a fourth gas, said economizer receiving said fourth gas for extraction of heat therefrom to produce a discharge gas, said economizer receiving liquid water condensate from said steam turbine and receiving heat from said fourth gas for warming said water and discharging said warmed water to said evaporator, said evaporator receiving heat from said third gas for producing input steam from said warmed water, said input steam being discharged to said reheat combustor to form superheated steam.

4,272,954

GAS TURBINE HAVING A CERAMIC ROTOR

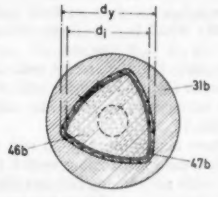
Sven-Olof Kronogard, Lomma, Sweden, assignor to United Turbine AB & Co., Kommanditbolag, Malmo, Sweden

Division of Ser. No. 839,273, Oct. 4, 1977, Pat. No. 4,176,519, which is a division of Ser. No. 638,052, Dec. 5, 1975, Pat. No. 4,064,690, which is a continuation-in-part of Ser. No. 471,176, May 17, 1974, Pat. No. 3,943,703. This application Jun. 25, 1979, Ser. No. 51,756

Claims priority, application Sweden, May 22, 1973, 7307153

Int. Cl.³ F01D *5/28, 5/30*

U.S. Cl. 60—39.16 R **2 Claims**



1. In a gas turbine power plant comprising a compressor, a first turbine rotor mounted upon the shaft as, and imparting rotary movement to said compressor, at least one further turbine rotor mounted upon a shaft separate from that of said first turbine rotor and compressor combination, and at least one combustion chamber having fuel supply means, receiving air from the compressor and supplying combustion gas to said first and at least one further turbine rotor, the improvement comprising said shaft mounting said first turbine rotor and said compressor, being hollow, said first turbine rotor being manufactured of ceramic material and being provided with an integral stub shaft introduced into the void at the end of said hollow shaft, means including a resilient clamping member and a tightening rod connected integrally therewith at one end to said clamping member for retaining said stub shaft to said hollow shaft, said clamping member having a corrugated sleeve portion enclosing said stub shaft, means for preventing relative rotation during torque transfer including said stub shaft, said corrugated sleeve and said void at the end of said hollow shaft all having mating, but successively bigger polygonal cross sections.

4,272,955

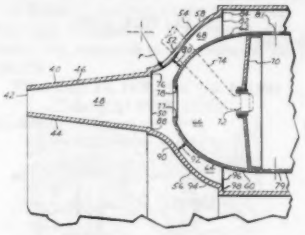
DIFFUSING MEANS

Jacob S. Hoffman, Ipswich, and Mario E. Abreu, South Peabody, both of Mass., assignors to General Electric Company, Lynn, Mass.

Filed Jun. 28, 1979, Ser. No. 53,121

Int. Cl.³ F02C *3/08*

U.S. Cl. 60—39.36 **18 Claims**



2. Diffusing apparatus for converting the dynamic head of a flowing stream of fluid discharged from a compressor into static pressure, said apparatus comprising:

first diffusing means receiving said fluid from said compressor for decelerating said fluid from a first velocity to a second velocity;

means disposed downstream of said first diffusing means for accelerating said fluid to a third velocity having a magnitude greater than the magnitude of said second velocity; and

second diffusing means disposed downstream of said accelerating means for decelerating said fluid from said third velocity to a fourth velocity having a magnitude less than the magnitude of said second velocity;

means disposed downstream of said second diffusing means for suddenly expanding said fluid to reduce the velocity of said fluid to a fifth velocity having a magnitude less than the magnitude of said fourth velocity.

4,272,956

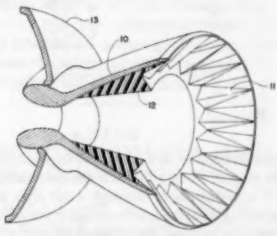
TIME DELAY DEVICE FOR DEPLOYABLE ROCKET NOZZLE SKIRTS

Garland C. Lamere; Frank S. Inman, and Ronald B. Mitchell, all of Brigham City, Utah, assignors to Thiokol Corporation, Newtown, Pa.

Filed Jan. 22, 1979, Ser. No. 5,536

Int. Cl.³ F02K *1/24*

U.S. Cl. 60—242 **9 Claims**



1. A rocket motor having an expansion cone, a combustion

gas deployable skirt for the expansion cone and a barrier blocking gas flow to said deployable skirt in its undeployed condition, means retaining said barrier in said expansion cone, and said barrier removed by the erosive action of the combustion gas after a predetermined time of operation of the motor has elapsed to unblock gas flow to said deployable skirt.

4,272,957

FUEL CONTROL SYSTEM FOR A RAM JET ENGINE

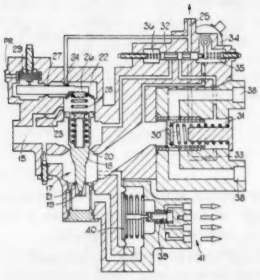
Geoffrey A. Lewis, Solihull, and Arthur L. Lloyd, Wolverhampton, both of England, assignors to Lucas Industries Limited, Birmingham, United Kingdom

Filed Oct. 31, 1978, Ser. No. 956,416

Claims priority, application United Kingdom, Nov. 5, 1977, 46135/77

Int. Cl.³ F02K *7/10*

U.S. Cl. 60—243 **7 Claims**



1. A fuel control system for a ram jet engine having both main and pilot burners comprises a metering device having a first control means movable in response to an air pressure signal at the engine air intake, for controlling fuel flow to the main and pilot burners of the engine, and a second control means, movable with said first control means, for controlling fuel flow from the downstream side of said first control means to the engine pilot burners.

4,272,958

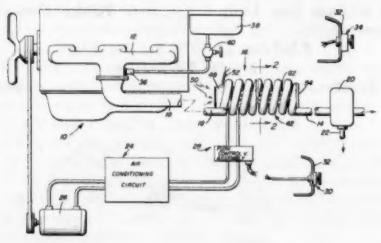
ANTI-POLLUTION TREATING DEVICE

Owen R. Waltrip, Roseville, Calif., assignor to U.S. Emission Systems, Inc., Casper, Wyo.

Filed May 8, 1979, Ser. No. 37,115

Int. Cl.³ F01N *3/02;* **F28D** *7/12*

U.S. Cl. 60—309 **15 Claims**



1. In combination with a source of combustion products and an exhaust system through which the combustion products are discharged to atmosphere through a tail pipe, an anti-pollution device including heat transfer conduit means enclosing a single cooling zone for exclusively conducting said combustion products from said source to the tail pipe along a helical path, cooling means disposed in said cooling zone for conducting coolant in non-contacting heat exchange relation to the combustion products during travel thereof along said helical path, and control means connected to the cooling means for controlling cooling of the combustion products by the coolant to effect separation of noxious components of the combustion products by entrainment in liquid condensate formed internally within the conduit means.

4,272,959

DIAPHRAGM BREAKAGE CONDITION DETECTING DEVICE FOR A PRESSURE CONTROL DEVICE

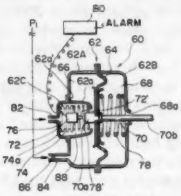
Ken Yamane, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Dec. 26, 1979, Ser. No. 107,457

Claims priority, application Japan, Jan. 20, 1979, 54-5433

Int. Cl.³ F02D *23/00;* **G08B** *21/00*

U.S. Cl. 60—602 **5 Claims**



1. A diaphragm breakage condition detecting device for a pressure control device comprising:

(a) a casing **(62)**,

(b) a diaphragm member **(64)** pertitioning the casing **(62)** into a first chamber **(66)** and a second chamber **(68)**, said second chamber **(68)** having an opening **(68*a*)** exposed to air,

(c) a compression spring **(78)** interposed between the diaphragm member **(64)** and the inner wall of said casing **(62)** within said second chamber **(68)**.

(d) an actuating rod **(70)** one end of which is supported by said diaphragm member **(64)**, while the other end thereof extends towards exterior of said casing **(62)** through said opening **(68*a*)**,

(e) a breakage detecting switch **(72)** supported by a displaceable partitioning member **(74)** which is at the bottom portion thereof mounted on an inner wall of said second chamber **(68)**, which is opposite to said diaphragm member **(64)**,

(f) a third chamber **(76)** defined by said displaceable partitioning member **(74)** and the inner wall of said casing **(62)**,

(g) a control vacuum P_1 supplied into said first and third chambers **(66, 76)**,

whereby, if there occurs breakage in said diaphragm member **64**, said breakage detecting switch **(72)** mounted on said displaceable partitioning member **(74)** moves towards said diaphragm member **(64)** to become in contact with the one end of said actuating rod **(70)**, thereby to become operative to detect the breakage in said diaphragm member **(64)**.

4,272,960

PROCESS AND SYSTEM FOR RECOVERY OF WORKING FLUID FOR DIRECT CONTACT HEAT EXCHANGE

Edward F. Wahl, III, Claremont, Calif., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.

Filed Feb. 6, 1978, Ser. No. 875,213

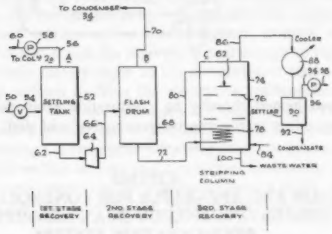
Int. Cl.³ F03G *7/00*

U.S. Cl. 60—641 D **6 Claims**

1. In a system for recovery of energy from hot water-containing fluids including geothermal brine and other hot water-containing sources, said system comprising heat exchange column means for direct contact heat exchange between said

hot water-containing fluid and an immiscible working fluid, to produce a heated working fluid and a cooled aqueous liquid-containing working fluid, means for expanding the resulting heated working fluid to produce work, condenser means for condensing the expanded working fluid, means for returning the condensed working fluid to said heat exchange column means and means for withdrawing said cooled liquid from said column means, the improvement which comprises in combination,

(a) settling means communicating with said heat exchange column means for settling said cooled liquid withdrawn from said column means, to separate some of said working fluid from said liquid,



(b) flash means communicating with said settling means for flashing said separated cooled liquid from step (a) to flash off additional working fluid and to further reduce the content of working fluid in said cooled liquid,

(c) stripping column means communicating with said flash means for steam stripping said cooled and flashed liquid to still further reduce the content of working fluid therein,

(d) heat transfer coil means in the bottom portion of said stripping column means for conducting cooled liquid through said coil means,

(e) means for conducting the cooled liquid exiting said coil means onto the top of said stripping column means, and

(f) means for introducing wellhead brine or steam into the bottom portion of said steam stripping column means.

4,272,961

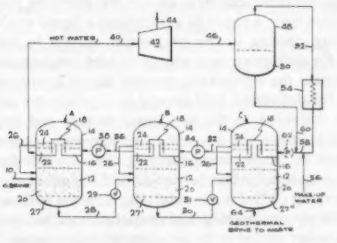
RECOVERY OF ENERGY FROM GEOTHERMAL BRINE AND OTHER AQUEOUS SOURCES

Pasupati Sadhukhan, La Verne, Calif., assignor to Occidental Research Corporation, Irvine, Calif.

Continuation of Ser. No. 861,907, Dec. 19, 1977, abandoned. This application Jun. 21, 1979, Ser. No. 50,868

Int. Cl.³ F03G *7/04*

U.S. Cl. 60—641 D **36 Claims**



1. A process for recovery of energy from hot aqueous liquids containing a non-volatile solute which comprises providing a plurality of interconnected like stages, and in each stage thereof

(a) directly contacting a hot aqueous first liquid with a water immiscible second liquid having a boiling point lower than said first hot liquid in an evaporator zone, causing said immiscible second liquid to boil and generate vapor,

(b) contacting the vapor of said immiscible second liquid generated during said boiling with cooler water in a condenser zone,

(c) causing condensation of said vapor of said second liquid and heating said water by transfer of latent heat from the condensing vapor,

(d) withdrawing condensed second liquid, and

(e) recycling said condensed immiscible second liquid from said condenser zone to said evaporator zone.

4,272,962

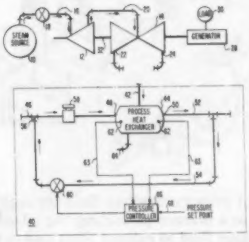
PRESSURE CONTROLLER FOR DUAL PURPOSE STEAM TURBINE POWER PLANT

Paul W. Viscovich, Swedesboro, N.J., and Moti T. Khemlani, West Chester, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 13, 1978, Ser. No. 968,951

Int. Cl.³ F01K *17/00*

U.S. Cl. 60—648 **16 Claims**



1. A heat exchanger for use in a dual purpose steam turbine power plant wherein steam extracted from said steam turbine power plant is supplied through one section of said heat exchanger and a process fluid is conducted through another section of said exchanger, which is physically isolated from said one section, said heat energy of said extracted steam being transferred to said process fluid within said heat exchanger to elevate the temperature of said process fluid, said heat exchanger comprising:

an input end into which said process fluid is supplied to said another section;

an output end to exit process fluid at elevated temperatures from said another section;

means for returning heated process fluid to said input end to be mixed with the process fluid supplied to said another section;

means for causing said mixed process fluid to flow through said another section;

means for regulating the flow of process fluid returned back to said input end from said output end;

means for generating a signal representative of the pressure of said extracted steam in said one section; and

means governed by said steam pressure representative signal and a desired pressure set point signal to control said flow regulating means to influence the pressure of the extracted steam as conducted through said one section.

4,272,963

CYCLIC ENERGY TRANSFORMATION APPARATUS

Giles P. Lay, Sulphur, Okla., assignor to Layco, Inc., Sulphur, Okla.

Filed Oct. 3, 1979, Ser. No. 81,344

Int. Cl.³ F01K *23/02;* **F02C** *1/02*

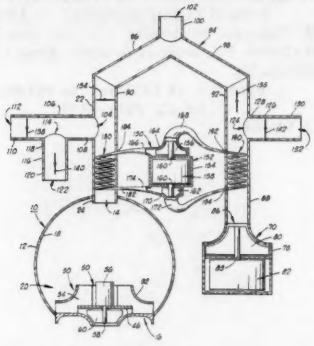
U.S. Cl. 60—655 **12 Claims**

1. An apparatus for deriving beneficial results from the

separation of a flow of primary working fluid into branches of flow having different energy characteristics, comprising:

a spheroid container having an outlet bore diametrically disposed from an inlet bore, with a first outlet port substantially equidistant between such bores, and having an internal surface shaped to deflect a primary working fluid into non-conflicting streamlines that form a vortical ring flow pattern within the provided internal cavity;

a vortical ring flow generator assembly disposed within, and suitably connected to said inlet bore of said spheroid container, and having an initial inlet port, an internal inlet port, a plurality of channel outlet ports, and a plurality of stationary volute vanes arranged to merge the flow of primary working fluid through said initial inlet port with



the flow of primary working fluid through said internal inlet port in a manner permitting the mixed flow of primary working fluid to exhaust from said outlet port with a minimum of turbulence; and

a powered pump assembly, suitably connected to said vortical ring flow generator assembly, having a motor and an impeller arranged so that the application of an external source of power causing a pumping action that draws the primary working fluid through said initial inlet port, in a manner that induces additional flow through the internal inlet port, and causes primary working fluid to flow through said vortical ring flow generator outlet port for circulation within said spheroid container internal cavity as such flow is branched for exit through said spheroid container first outlet port or outlet bore.

4,272,964

STEAM GENERATING APPARATUS

Yoshio Kumagai, Takahagi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 18, 1979, Ser. No. 31,297

Claims priority, application Japan, Apr. 24, 1978, 53/47737

Int. Cl.³ F01D *11/04;* F22B *1/02*

U.S. Cl. 60—657 **8 Claims**

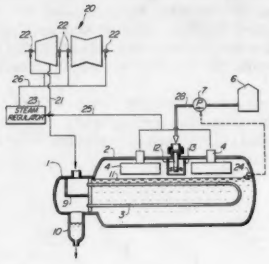
1. A steam generating apparatus comprising:

a shell containing feed water introduced thereinto; and

heating pipes submerged in the feed water contained in said shell for permitting a heating fluid of high temperature to flow therethrough, indirect heat exchange being effected between the heating fluid and the feed water in said shell through said heating pipes so as to evaporate the feed water;

said apparatus further comprising

a spray valve mounted in a space above the liquid level of the feed water in said shell for scattering condensate in atomized particles in said shell, said spray valve including resilient means mounted therein for varying the degree of opening of said spray valve according to the pressure of the condensate supplied to said spray valve, arrangement being such that the atomized particles of the condensate delivered into said shell through said spray valve are brought into contact with steam generated in said shell



and heated thereby to a saturation temperature corresponding to the internal pressure of said shell.

4,272,965

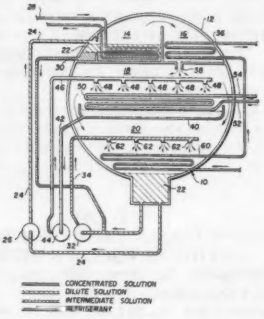
METHOD AND APPARATUS FOR CONTROLLING AND CONSERVING ENERGY IN AN ABSORPTION REFRIGERATION SYSTEM

Richard W. Thoms, Dickerson, Md., assignor to Parklawn Associates, Inc., Rockville, Md.

Filed Jun. 7, 1979, Ser. No. 46,284

Int. Cl.³ F25B *15/00*

U.S. Cl. 62—104 **8 Claims**



1. In an absorption refrigeration system including a concentrator section, a condenser section, an evaporator section and an absorber section, and a closed loop fluid path for delivering a refrigerant from section to section and changing phases of the refrigerant from a vapor to a liquid and a liquid to a vapor and providing cooling in the evaporator section in the process, means for delivering heat energy to said concentrator section to vaporize the refrigerant, control means connected to said means for delivering heat energy to regulate the rate of heat energy delivered to the condenser section and thus energy utilized to drive the absorption refrigeration system, closed loop heat exchange means carrying chilled water for distribution to a system load to be cooled and including an inlet portion carrying chilled water returning from the system load, and an outlet portion leaving said evaporator section for carrying chilled water cooled in the evaporator to the system load to be cooled, wherein the improvement comprises:

temperature sensing means connected exclusively to the inlet portion of said closed loop heat exchange means for sensing the temperature of chilled water returning from the systemm load before entering said evaporator section; and

means operably connecting said temperature sensing means

and said control means for effecting regulation of said control means in response to the temperature of chilled water entering the refrigeration system evaporator section from the system load and irrespective of the temperature of chilled water leaving the refrigeration system evaporator section.

5. A method for controlling and conserving energy utilization in an absorption refrigeration system including a concentrator section, a condenser section, and evaporator section and an absorber section, and a closed loop fluid path for delivering a refrigerant from section to section and changing phases of the refrigerant from a vapor to a liquid and a liquid to a vapor and providing cooling in the evaporator section in the process, means for delivering heat energy to said concentrator section to vaporize the refrigerant in the concentrator for delivery of the vaporized refrigerant to the condenser, control means connected to said means for delivering heat energy to regulate the rate of heat energy input to the concentrator section and thus energy utilized to drive the absorption refrigeration system, close loop heat exchange means carrying chilled water for distribution to a system load to be cooled and including an inlet section carrying chilled water returning from the system load and an outlet section leaving said evaporator section for carrying chilled water cooled in the evaporator system to the system load to be cooled, wherein the improvement comprises the steps of:

sensing the temperature of chilled water exclusively as the water returns from the system load to be cooled before the chilled water enters the evaporator; and

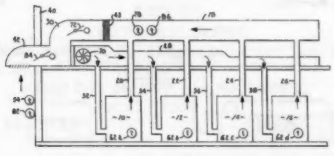
controlling the amount of heat energy delivered to the concentrator section as a function of the temperature of the returning chilled water coming from the system load to be cooled irrespective of the temperature of the chilled water leaving the refrigeration system evaporator section.

4,272,966

COOLING SYSTEM UTILIZING OUTSIDE AIR

Eugene E. Niemann, and Kelly E. Niemann, both of 100 W. 4th St., Appleton City, Mo. 64624

Filed Oct. 19, 1979, Ser. No. 86,280
Int. Cl.³ F25D *17/00*
U.S. Cl. 62—180 **8 Claims**



1. Equipment for cooling a plurality of containers inside of a building, each of said containers characterized by a refrigeration unit in association therewith, said equipment being responsive to ambient air temperature and utilizing said outside air for cooling, said equipment comprising:

first duct means for collecting cooled air from said containers and returning it to said containers;

blower means disposed in said duct means for recycling the collected air to said containers;

auxiliary cooling means disposed in said duct means downstream from said blower mean;

first temperature responsive means for sensing the temperature of said ambient air;

first circuit means coupled with said first temperature responsive means for deactivating said refrigeration units in response to a first temperature drop and activating said auxiliary cooling means and said blower means;

second duct means for receiving outside air, said second duct means being in communication with said first duct means;

primary closure means for opening and closing said second duct means to the passage of air therethrough;

second temperature responsive means for sensing the temperature of the ambient air; and

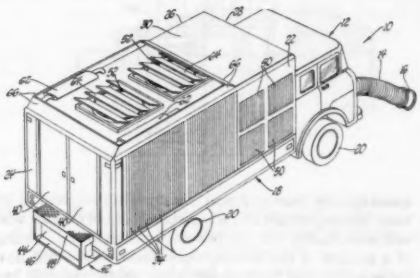
second circuit means coupled with said second temperature responsive means for operating said primary closure means in response to a second temperature drop whereby said closure means is opened and outside air is brought into said second duct.

4,272,967

SELF-CONTAINED PORTABLE AIR-CONDITIONING SYSTEM

Jack H. White, Fountain Valley, and Joseph M. FitzGerald, Buena Park, both of Calif., assignors to Lear Siegler, Inc., Santa Ana, Calif.

Continuation of Ser. No. 918,016, Jun. 22, 1978, abandoned.
This application Mar. 31, 1980, Ser. No. 135,746
Int. Cl.³ F25B *27/00*; B60H *3/04*
U.S. Cl. 62—236 **3 Claims**



1. A self-contained, self-propelled air-conditioning apparatus for providing air to a structure having an inlet for conveying the air through the structure, said system comprising:

a frame mounted on rotatable wheels,

driving means for rotating said wheels,

a prime mover mounted on said frame for supplying mechanical energy,

starting means for starting said prime mover,

a generator mechanically connected to said prime mover for changing the supplied mechanical energy into electrical energy,

a ventilation system mounted on said frame for moving air from the ambience to the inlet duct,

two refrigeration systems mounted on said frame, each selectively operable alone or with the other for cooling said moving air, and

an electrical control circuit for selectively electrically connecting each of said ventilation, and refrigeration systems to said generator and for selectively electrically connecting each of said ventilation, and refrigeration systems to an external electrical power source, said control circuit including means for automatically breaking the electrical connection to the generator and for disabling said starting means when there is electrical connection to the external electrical power source.

4,272,968

CONVERTIBLE DISPENSER

William A. Harvill, Stone Mountain, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

Filed Jul. 10, 1979, Ser. No. 56,270
Int. Cl.³ B67D *5/62*; F25D *19/02*
U.S. Cl. 62—394 **4 Claims**

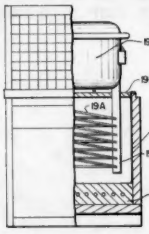
1. A convertible cooling system for a post-mix or pre-mix beverage dispenser for cooling at least one beverage product

which is supplied from a beverage container through the cooling system to a discharge valve comprising:

a cooling tank in which a refrigeration means is positioned for cooling the beverage product, said cooling tank including four upwardly projecting sidewalls terminating in an open top portion;

a heat transfer plate positioned in the cooling tank forming an integral bottom portion thereof and being sealably affixed to said four upwardly projecting sidewalls to form a liquid-tight compartment, said heat transfer plate including a plurality of flow paths therethrough in communication with said beverage product and said discharge valve; and

a removable mechanical refrigerating means for cooling said beverage within said flow paths to a predetermined temperature including a coil which projects into said cooling tank a predetermined distance while providing an ade-



quate spacing from said heat transfer plate wherein an ice bank forming on said coil is maintained out of contact with said heat transfer plate to prevent cold spots and freezing of a portion of the beverage contained within said flow paths within said heat transfer plate, said removable mechanical refrigerating means including a plate for providing a closure to said open top portion of said cooling tank;

said removable mechanical refrigerating means including downwardly projecting legs for providing a support when removed from the cooling tank and further including an agitator rotatably driven by a motor for circulating liquid within said cooling tank;

whereby said mechanical refrigerating means may be readily removed from said cooling tank and ice particles positioned directly on said heat transfer plate thereby providing the refrigeration means for cooling said beverage to said predetermined temperature.

4,272,969

METHOD FOR REFRIGERATING FRESH PRODUCTS AND KEEPING THEM FRESH, AS WELL AS REFRIGERATOR FOR CARRYING OUT THIS METHOD

Fernand Schwitzgebel, c/o Hermann Forster, CH 9320 Arbon, Switzerland

Filed Feb. 3, 1978, Ser. No. 874,941

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1977, 2704562; Dec. 23, 1977, 2757644

Int. Cl.[3] **F25D** *17/06;* **F24F** *3/16;* **F25D** *21/00, 5/00*

U.S. Cl. 62—419 **13 Claims**

1. A high humidity refrigerator for preventing the withdrawal of moisture from food products therein, said refrigerator including

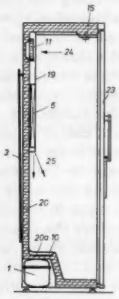
(a) a cold insulated compartment

(b) a compressor, condenser and evaporator connected by refrigerant lines

(c) said evaporator being positioned within, and in the upper portion of, said cold insulated compartment, and having a surface temperature above 0° C.

(d) a continuously operating fan located within said cold insulated compartment above said evaporator for directing air vertically downwardly past the evaporator to prevent icing of the evaporator surface, resulting in the formation of condensation thereon, and

(e) a drip dish in the lower portion of the compartment beneath the evaporator for receiving water produced by the condensation dropping from the evaporator



(f) said drip dish lying in the direct path of the air flow from the fan, whereby the air impinges upon the water contained in the drip dish to constantly absorb moisture therefrom and return it into the air surrounding the goods being refrigerated.

4,272,970

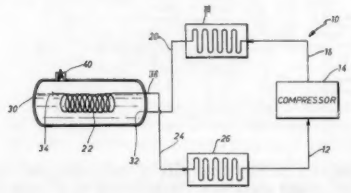
COMPRESSION REFRIGERATION SYSTEM

James R. Hobbs, 5303 Glenmont, Houston, Tex. 77081

Filed Feb. 4, 1980, Ser. No. 117,908

Int. Cl.[3] **F25B** *41/06*

U.S. Cl. 62—511 **11 Claims**



1. In a compression refrigeration system having a compressor, a condenser, an evaporator and a liquid refrigerant, the improvement in a restriction between the condenser and the evaporator comprising,

a capillary tube having an inlet and an outlet,

an enclosure surrounding the capillary tube,

the outlet of the capillary tube extending through the enclosure and connected to the inlet of the evaporator,

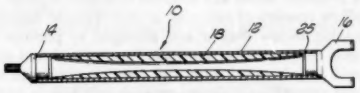
the inlet of the capillary tube being in fluid communication with the interior of the enclosure,

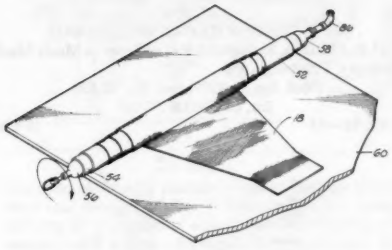
said enclosure having an inlet connected to the outlet of the condenser for receiving liquid refrigerant from the condenser which flows into the capillary tube inlet and also forms a heat exchange with the exterior of the capillary tube for providing a self-regulating flow through the capillary tube.

4,272,971
REINFORCED TUBULAR STRUCTURE

Morris S. Loyd, Northridge, and Timothy W. McGann, Anaheim, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 26, 1979, Ser. No. 16,454
Int. Cl.³ F16C 1/00, 3/00
U.S. Cl. 64—1 S 19 Claims



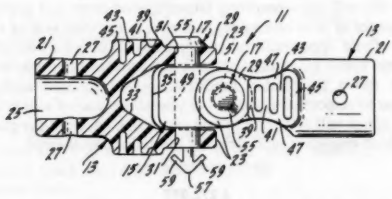


1. A reinforced tubular structure comprising:
a metal tube, said metal tube having inner and outer peripheral surfaces:
a cured composite tubular liner within said metal tube adhesively bonded to said inner peripheral surface of said metal tube, said liner comprising a plurality of plies of fibrous material in a solid resin matrix, said liner increasing the longitudinal stiffness of said tubular structure, said liner having a longitudinal Young's Modulus to density ratio greater than for the metal tube.

4,272,972
UNIVERSAL JOINT

Ian R. James, Lombard, Ill., assignor to Lovejoy, Inc., Downers Grove, Ill.

Filed Dec. 26, 1979, Ser. No. 106,672
Int. Cl.³ F16D 3/26
U.S. Cl. 64—17 SP 3 Claims

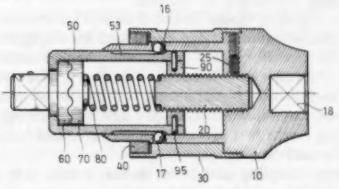


1. A universal joint formed of plastic and including two yokes and a block with the block received between and pivotally connected to the yokes,
each of said yokes including a cylindrical portion having a shaft receiving bore at one end and a pair of arms integrally formed at the other end with the outer surfaces of the arms being spaced apart a distance which is greater than the outer diameter of the cylindrical portion,
aligned pin receiving bores formed in the arms near the free ends thereof to receive pins pivotally connecting the block to the yokes,
a diametrically extending rib connecting said arms and positioned at the base of said arms to prevent free pivotal movement of the block relative to the yokes, and
transversely extending strengthening ribs formed on the exterior diametric surfaces of the yoke arms with the transversely extending ribs aligned with the diametrically extending rib at the base of the arms,
said transversely extending strengthening ribs extending at right angles to the diametrically extending rib at the base of the arms.

4,272,973
SOCKET JOINT FOR TORQUE WRENCH

Lee Fu-Tsai, No. 209-10 Kuang-Ming Rd., Taichung, Taiwan

Filed Apr. 26, 1979, Ser. No. 33,431
Int. Cl.³ F16D 7/06
U.S. Cl. 64—29 14 Claims

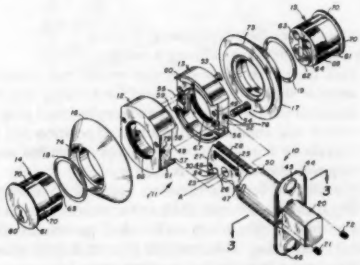


1. An assembly for torque wrenches comprising:
a body provided with a circular chamber at one end and a rectangular socket at another end;
a bolt having one end fixed to a central screw hole of said circular chamber;
a clutch casing, said casing being a circular tube having a protruding ring provided on inner wall of one end thereof;
a clutching means disposed in said casing, said clutching means including a rectangular plug assembly resting upon said protruding ring;
a spring positioned between said bolt and clutching means; and
a positioning nut threaded to said bolt and secured to another end of said clutch casing.

4,272,974
DEAD BOLT LOCK

Thomas F. Hennessy, Bristol, Conn., assignor to Lori Engineering Corporation, Southington, Conn.

Filed Jan. 25, 1979, Ser. No. 6,564
Int. Cl.³ E05B 9/06, 65/06; E05C 1/06
U.S. Cl. 70—129 16 Claims



1. A key operable dead bolt lock comprising:
housing means, said housing means defining a first axis which will be generally transverse to the plane defined by

the face of a door in which the lock is installed, said housing means further defining a bolt means receiving passage which is transverse to and intersects said first axis;

at least a first key operated actuator means, said first actuator means having an axis and being releasably received in said housing means coaxially with said first axis, said actuator means having a rotatable cam means extending from a first end thereof, said cam means being rotated in response to rotation of a removable key, said first actuator means first end being disposed oppositely to the key receiving end of said first actuator means;

elongated bolt means, said bolt means having an axis and including a retractable bolt which may be extended from a first end of said bolt means, the second end of said bolt means being received in said housing means passage, said bolt means second end intersecting said housing means first axis;

means for releasably securing said bolt means to said housing means;

lever means, said lever means being pivotally supported on said bolt means second end;

cam follower means mounted on said lever means, said cam follower means being positioned for engagement by said first actuator means cam means whereby rotation of a key received in said first actuator means will be translated into motion of said lever means, said cam follower means being moved to opposite sides of a first plane through said housing means first axis and transverse to said bolt means axis by said cam means;

means coupling said lever means to said bolt means bolt whereby said bolt will be extended and retracted in accordance with the movements of said lever means; and

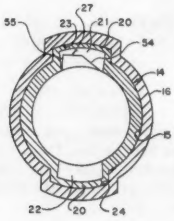
means for locking said first actuator means in said housing means.

4,272,975

CYLINDER LOCK WITH KEY REMOVABLE CORE

George P. Patriquin, Gardner, Mass., assignor to Hudson Lock, Inc., Hudson, Mass.

Filed Jul. 6, 1979, Ser. No. 55,925
Int. Cl.³ E05B *15/14, 29/02*
U.S. Cl. 70—369 **10 Claims**



1. A cylinder lock comprising:

an annular housing defining a cavity;

a lock core retained within said cavity and comprising an annular shell with an inner surface defining longitudinally directed shell spline means, and a cylindrical plug retained within said annular shell in a locked position and rotatable therein in one direction to an open position and in the opposite direction to a release position;

a plurality of locking tumblers retained by said plug and engageable with said shell spline means to prevent rotation of said plug from said locked position, said locking tumblers being withdrawable from said shell spline means by a properly bitted key inserted into a keyway defined by said plug;

an actuator member coupled to said plug so as to undergo movement in response to rotation thereof;

a locking member movable between latched and unlatched positions by said actuator member;

release tumbler means retained by said plug and engaged with said shell spline means with said plug in said locked position, said release tumbler means and said shell spline means being shaped and arranged to permit rotation of said plug in said one direction and to prevent rotation of said plug in said opposite direction, said release tumbler means being withdrawable from said shell spline means by a properly bitted key inserted into said keyway so as to allow rotation of said plug in said opposite direction; and

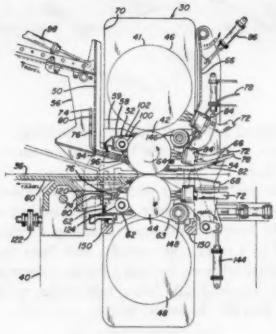
retaining means shaped and arranged to prevent relative axial movement between said housing and said core with said plug in said locked and open positions and to allow said relative axial movement with said plug in said release position.

4,272,976

HOT STRIP ROLLING MILL STAND

Ronald D. Pizzedaz, Springdale, Pa., assignor to Mesta Machine Company, Pittsburgh, Pa.

Filed Jun. 5, 1979, Ser. No. 45,638
Int. Cl.³ B21B *27/10*
U.S. Cl. 72—45 **15 Claims**



1. In a rolling mill wherein at least upper and lower mill rolls are rotatably mounted in window means of a mill housing to reduce strip passed therebetween and wherein a direct application lubricant is applied to said mill roll on the entry side of such a rolling mill, the improvement comprising: applying means to continuously apply such direct application lubricant to adjacent peripheral portions of said mill rolls prior to said adjacent peripheral portions engaging such strip for the reduction thereof; and smoothing means spaced from said applying means, of at least said upper mill roll, in the direction of rotation of said upper mill roll and operable to direct a flow of air to said upper mill roll to smooth and control the thickness of such direct application lubricant applied by said applying means to respective adjacent peripheral portions of said at least said upper mill roll prior to said respective adjacent peripheral portions engaging such strip for the reduction thereof.

4,272,977

METHOD AND APPARATUS FOR NECKING-IN AND FLANGING A CONTAINER BODY

Laszlo A. Gombas, Rte. 7, Box 555Q, Evergreen, Colo. 80439

Filed Jun. 7, 1979, Ser. No. 46,231
Int. Cl.³ B21D *41/04*
U.S. Cl. 72—121 **57 Claims**

1. Apparatus for simultaneously necking-in and flanging the cylindrical side wall of a container body adjacent to an open axial end thereof, comprising:

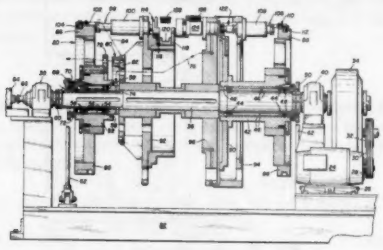
(a) a mandrel having forward and rearward ends with a

longitudinally extending axis of rotation extending therebetween;

(b) first roller means carried by the mandrel near the forward end thereof in axially slidable relationship for radially supporting the side wall of a container inserted over the first roller means;

(c) second roller means carried by the mandrel rearwardly of the first roller means in axially slidable relationship with the mandrel for radially supporting the side wall of a container inserted over at least a forward portion of the second roller means;

(d) can end nest means carried by the mandrel with at least



a portion of the next means at a radial spacing outwardly from said forward portion of the second roller means for defining in combination with the forward portion of the second roller means a forwardly opening groove for receiving, in use, a container side wall marginal end and encapsulating the radial outer surface thereof; and

(e) necking die means carried by said mandrel for radial movement in the plane between said first and second roller means for, in use, deforming the cylindrical side wall of a container inserted over said roller means while inducing axial separation of the two rollers to accommodate at least partial entry of the necking die means between the rollers.

4,272,978

PROGRESSIVE STAGE FORGING MACHINE

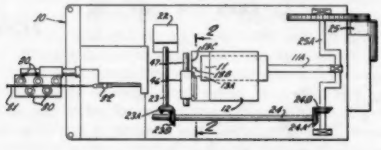
Imre Berecz, 917 Acapulco St., Laguna Beach, Calif. 92651

Filed Sep. 3, 1974, Ser. No. 502,352

The portion of the term of this patent subsequent to Dec. 16, 1985, has been disclaimed.

Int. Cl.³ B21D *43/02, 45/00;* B21K *1/44*

U.S. Cl. 72—335 **9 Claims**



1. A progressive stage forging machine for forming articles of steel and like material from work piece blanks cut from material stock, said machine comprising:

(a) a frame;

(b) a source of power;

(c) a power ram mounted in the frame for reciprocating movement along a rectilinear path of travel between an extended position and a retracted position;

(d) first power transmission means, including a main crankshaft, interconnecting the power source and the ram for powered reciprocal movement along said path of travel;

(e) first, second, and third punches carried at the distal end of the ram and arranged at intervals of spacing transversely related to the path of travel of the ram;

(f) first, second, and third dies carried by the frame and arranged at first, second, and third die stations spaced transversely of said path, the dies being in individual positions of cooperation aligned respectively with one of said punches;

(g) means mounting the first of said dies in a fixed aligned position relative to the first of said punches;

(h) indexing means carried by the frame and mounting each of the remaining two of said dies for alternative shifting of the second die and the third die between positions alternatively, respectively aligned with the second punch and the third punch;

(i) transfer means to feed an individual work piece blank to the first die station;

(j) separate transfer means to effect transfer of an individual blank from the first die station to the second die station;

(k) second power transmission means, including timing mechanism, connected between the main crankshaft and both of said transfer means to effect timed transfer of the blanks respectively held thereby, the transfer occurring prior to a predetermined extended position of the ram and a corresponding position of rotation of the crankshaft; and

(l) third power transmission means, including timing mechanism connected between the main crankshaft and said indexing means to effect shifting of the second die and the third die between positions alternatively, respectively aligned with the second punch and the third punch, such shifting commencing after each stroke of the ram to an extended position and being completed within a predetermined arc of rotation of the crankshaft, so that upon successive extensions of the ram, the third punch delivers a finishing blow to a work piece blank on each such extension, the first finishing blow being delivered to a blank carried in one of either the second die or the third die, and the next blow being delivered to a blank carried in the other of such dies.

4,272,979

METHOD AND APPARATUS FOR FORGING CRANK THROWS

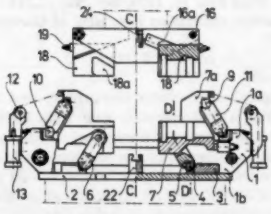
Tadeusz Rut, Poznan, Poland, assignor to Instytut Obrobki Plastycznej, Poznan, Poland

Filed Jan. 11, 1979, Ser. No. 2,777

Claims priority, application Poland, Jan. 14, 1978, 204016; Nov. 22, 1978, 211132

Int. Cl.³ B21K *1/08*

U.S. Cl. 72—356 **12 Claims**



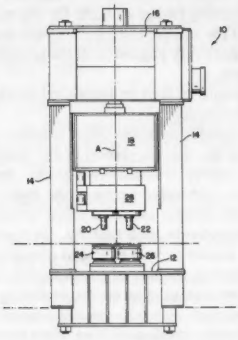
1. A method of forging crank throws in which a portion of a bar is upset by applying opposed longitudinal forces on the said portion and its middle part is bent in a direction which is perpendicular to the direction of the upsetting forces, wherein during the upsetting step, before the bending of the middle part, the flowing material is directed to form at the ends of the upset portion two upset projections which are situated eccentrically to the axis of the bar and which include crests which are directed opposite to the intended bending direction of said middle part.

4,272,980

LOAD EQUALIZER FOR PRESS TOOLING

Louis F. Carrieri, LaGrange Park, Ill., assignor to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Aug. 10, 1979, Ser. No. 65,562
Int. Cl.³ B21J *13/02*
U.S. Cl. 72—404 **20 Claims**



1. In a hydraulic load equalizing system for press tooling comprising first and second tool means, tool support means, means including corresponding piston means and cylinder means supporting each said first and second tool means for reciprocation between extended and retracted positions relative to said tool support means, means connecting said cylinder means in fluid flow communication with one another and with a source of hydraulic fluid, whereby displacement of one of said tool means in the direction from the extented toward the retracted position thereof displaces the other of said tool means in the direction from the retracted toward the extended position thereof, the improvement comprising: said first and second tool means each having a neutral position between the corresponding extended and retracted positions, and means biasing each said tool means in the direction from the extended toward the neutral position thereof.

4,272,981

WORKPIECE MANIPULATOR FOR FORGING PRESS

Horst Endter, Düsseldorf, Fed. Rep. of Germany, assignor to Maschinenfabrik Hasenclever Gesellschaft mit beschränkter Haftung, Düsseldorf, Fed. Rep. of Germany

Filed Feb. 15, 1979, Ser. No. 12,515
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1978, 2806987
Int. Cl.³ B21D *43/05*
U.S. Cl. 72—405 **7 Claims**

1. A workpiece manipulator comprising: first transmission means including a first epicyclic gear train having a rotary input and a crank output for movement of said output generally in a planar and square path on rotation of said rotary input through a predetermined angular distance, said path having generally parallel first and second sides and generally parallel third and fourth sides interconnecting said first and second sides and forming therewith a plane;

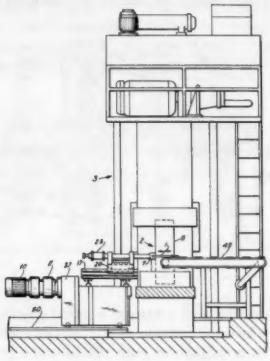
drive means including a second epicyclic gear train connected to said rotary input for rotating same at a speed increasing generally from a standstill to a predetermined speed then slowing generally to a standstill twice for each travel of said output about said square path, said standstills respectively corresponding to intermediate positions of said output along said first and second sides;

a traversing carriage coupled to said crank output and generally jointly displaceable therewith in said plane in a first direction generally parallel to said first and second sides and in a second direction generally parallel to said third and fourth sides;

a lift carriage coupled to said traversing carriage and jointly displaceable therewith in said second direction;

a holder carriage coupled to said lift carriage and jointly displaceable therewith in said first and second directions but independently displaceable relative thereto in a third direction generally perpendicular to said first and second directions;

an openable and closable workpiece holder carried on said holder carriage;



a threaded spindle extending generally in said first direction, threaded into said traversing carriage, carrying at said holder carriage a pinion, and nondisplaceable in said first direction relative to said lift carriage;

a rack fixed on said holder carriage, extending in said third direction, and in mesh with said pinion; and

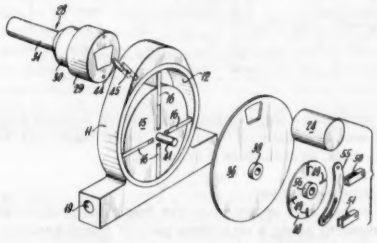
means for preventing said lift carriage from moving jointly in said first direction of displacement of said crank output between said intermediate positions and said fourth side for screwing of said spindle in said traversing carriage to rotate said pinion and displace said holder carriage in said third direction.

4,272,982

FLUID FLOW METER FOR MIXED LIQUID AND GAS

Dan M. Arnold, and Robert W. Pitts, Jr., both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Oct. 17, 1979, Ser. No. 85,571
Int. Cl.³ G01N *9/24*; G01F *1/90*
U.S. Cl. 73—19 **2 Claims**



1. Fluid flow meter for continuously measuring the rate of flow of a mixed fluid having both liquid and gas components, comprising in combination

positive displacement meter means comprising a housing having a circular cross section interior with tangential inlet and outlet passages adjacent to one side thereof,

a rotor eccentrically located in said interior and incorporating a balanced plurality of radial vanes biased into sealing relation with said housing interior for dividing said mixed fluid stream into at least one segment during flow through the meter,

a gamma ray densitometer having a beam directed across said segment adjacent to the other side of said housing interior for measuring the density of said mixed fluid in order to determine the percent of one of said components,

means mounted on said housing for measuring the pressure of said mixed fluid segment, and

means mounted on said housing for measuring the temperature of said mixed fluid segment,

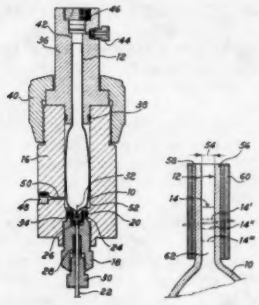
all whereby the linear flow rate of both liquid and gas components of said mixed fluid will be equal during said measurements.

4,272,983

APPARATUS FOR POROSIMETRIC MEASUREMENTS

Giorgio Sisti, Melzo; Ermete Riva, Merate, and Pietro Italiano, Cernusco sul Naviglio, all of Italy, assignors to Carlo Erba Strumentazione S.p.A., Italy

Filed Oct. 31, 1979, Ser. No. 89,994
Claims priority, application Italy, Dec. 13, 1978, 30787 A/78
Int. Cl.³ G01N *15/08*
U.S. Cl. 73—38 **7 Claims**



1. Apparatus for porosimetric measurements comprising a vessel for housing a solid to be analysed, said solid being immersed in mercury and suitable for being subjected to controlled pressure increases, said vessel including a neck portion taking the form of a gauged-diameter capillary where a mercury meniscus forms at any pressure condition during the measurement, said gauged-diameter capillary being formed of dielectric material and having walls exhibiting a gauged thickness, armature means formed of electrically conductive material externally surrounding said neck, means for electrically communicating through said vessel with mercury present therein, and means for connecting said armature means outside zones subjected to pressure and said electrically communicating means in a circuit including a power source and means for measuring capacity variations of a mercury condenser formed in said capillary between said mercury and said armature and the dielectric wall of said capillary.

4,272,984

PIPELINE LEAK DETECTION METHOD AND CONTROL DEVICE THEREFOR

David A. Bell, White City, Canada, assignor to Interprovincial Steel and Pipe Corporation, Ltd., Regina, Canada

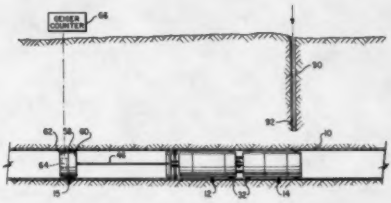
Filed May 18, 1979, Ser. No. 40,092
Int. Cl.³ G01M *3/02*
U.S. Cl. 73—40.5 R **6 Claims**

1. In or for use with a pipeline packer assembly having a packer unit for sealing the pipe when actuated and actuating means responsive to an energizing signal for selectively actuating the packer unit;

a control device for the actuating means comprising:

a gamma ray detector providing an electrical output signal representative of the gamma radiation detected by the detector, and

a signal processor receiving and responsive to the electrical output signal from the gamma ray detector and providing



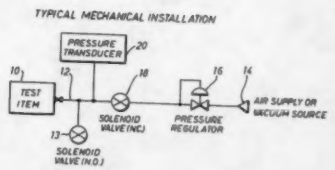
said energizing signal for the actuating means when the gamma radiation exceeds a set threshold level, said signal processor providing said energizing signal when the gamma radiation intensity exceeds a set threshold level for at least a set period of time, and wherein the signal processor includes a stepping switch which provides said energizing signal cyclically as the stepping switch is sequentially actuated.

4,272,985

METHOD OF AND APPARATUS FOR COMPENSATING FOR TEMPERATURE IN LEAK TESTING

William J. Rapson, Jr.; Leroy C. Delatorre, and Charles L. Thompson, all of Houston, Tex., assignors to Uson Corporation, Houston, Tex.

Filed Dec. 3, 1979, Ser. No. 99,777
Int. Cl.³ G01M *3/26*
U.S. Cl. 73—49.2 **7 Claims**



1. An apparatus for testing leaks in a test item having a temperature different than ambient temperature comprising,

means for sealing the test item in ambient air,

transducer means for measuring the pressure in the test item,

means conducted to the transducer means for measuring the rate of change of the pressure of the air sealing the test item for providing a temperature correction,

means connected to the measuring means for storing the rate of change measurement,

means for subjecting the test item to a pressurized fluid, and

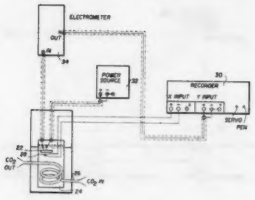
means connected between the storing means and the transducer for applying a temperature correction signal to the transducer measurement while testing for a leak in the test item.

4,272,986

METHOD AND MEANS FOR MEASURING MOISTURE CONTENT OF HERMETIC SEMICONDUCTOR DEVICES

Robert K. Lowry, Melbourne Beach, and Larry A. Miller, Palm Bay, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Apr. 16, 1979, Ser. No. 30,498
Int. Cl.[3] G01N *27/18*
U.S. Cl. 73—73 23 Claims



1. A method of measuring the amount of moisture in a hermetically sealed semiconductor device package comprising:

providing parallel conductive elements having a thickness no greater than 12,000 angstroms and a separation of no greater than 0.5 mils on an insulative surface is said package;

simultaneously lowering the temperature of said package at a rate no greater than 15° centigrade per minute to condense the water vapor and measuring the conductivity between said conductive elements; and

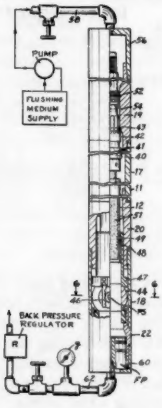
determining the moisture content from the temperature of maximum conductivity.

4,272,987

PRESSURE CORE BARREL FLUSHING SYSTEM

James T. Aumann, Salt Lake City, and Harold G. White, West Jordan, both of Utah, assignors to Christensen, Inc., Salt Lake City, Utah

Filed Dec. 3, 1979, Ser. No. 99,670
Int. Cl.[3] E21B *47/00*
U.S. Cl. 73—153 11 Claims



1. A flushing system for flushing drilling mud from a pressure core barrel assembly adapted for containing and maintaining a core sample taken from a bore hole sealed therein under a controlled pressure substantially equal to the pressure present at a depth in the bore hole at which the core sample is sealed off to freezing of the core sample for analysis comprising:

pressurizing inlet flushing means connected to an end portion of the pressure core barrel assembly containing movable sealing means and adapted for pressurizing and conveying a flushing medium under sufficient pressure into the pressure core barrel assembly to disengage and open the movable sealing means, flush out and displace drilling mud from the pressure core barrel assembly; and

pressurizable outlet flushing means connected to an opposite end portion of the pressure core barrel assembly containing valve sealing means operable to an open or closed position from the exterior of the pressure core barrel assembly and adapted for pressurizing, determining internal pressure, conveying and maintaining drilling mud displaced from the pressure core barrel assembly by the flushing medium substantially to at least the internal pressure therein at which the core sample was sealed in the bore hole;

whereby the sealing means in the pressure core barrel assembly will be opened for a more complete flushing of the drilling mud therefrom without loss of internal pressure and contents from the core sample, the core sample maintained and frozen at substantially the pressure it was sealed at in the bore hole and with the sealing means in the open position, the outlet flushing means disconnected and the frozen core sample extracted for analysis.

4,272,988

MULTIPLE SIGNAL THERMOPARTICULATING COATING

David C. Phillips; William M. Hickam, both of Pittsburgh, and James D. B. Smith, Turtle Creek, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 568,218, Apr. 15, 1975, abandoned.
This application Oct. 12, 1979, Ser. No. 84,223
The portion of the term of this patent subsequent to Dec. 25, 1996, has been disclaimed.
Int. Cl.[3] C09K *3/00;* G08B *21/00;* G01K *13/00, 1/00, 3/04, 3/08*
U.S. Cl. 73—339 R 11 Claims

1. A thermoparticulating coating on a substrate, said thermoparticulating coating comprising at least two solid layers one atop the other, each layer comprising at least one adhering compound which thermoparticulates at a different temperature between 60° and 200° C., said layers being arranged so that no layer is between said substrate and a layer which thermoparticulates at a higher temperature.

4,272,989

INSTRUMENT LANCE FOR BASIC OXYGEN STEELMAKING FURNACE

Nicholas M. Rymarchyk, Wexford, and Leo L. Meinert, Baden, both of Pa., assignors to Pullman Berry, Harmony, Pa.

Filed Sep. 4, 1979, Ser. No. 71,901
Int. Cl.[3] C21D *1/00;* G01K *1/12*
U.S. Cl. 73—432 R 13 Claims

1. A sensor lance for insertion into a vessel for monitoring process conditions for molten metal comprising:

a top adapter head including a first upper pipe section having an upper first horizontal flange,

a bushing sleeve spaced inwardly of said first upper pipe section having a tubular vertical portion in engagement with said first upper pipe section and including a second horizontal flange for connecting said bushing sleeve to said first horizontal flange,

a piston sleeve spaced inwardly of said bushing sleeve having an enlarged upper chamber, said piston sleeve being in sliding engagement within said bushing sleeve,

a central second pipe connected to and communicating with said piston sleeve,

a connecting member means connecting a relatively small diameter portion of the central second pipe to a relatively larger diameter portion of the piston sleeve for facilitating water flow thereabout,

a top horizontal plate connecting said first and second flanges,

a stub sleeve spaced inwardly of said piston sleeve and connected to said top plate projecting into said enlarged upper chamber,

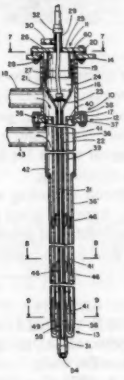
said stub sleeve being in relative sliding engagement with said piston sleeve to accommodate differential thermal expansion,

a water inlet connection on said first upper pipe section,

a third inner pipe spaced outwardly from said second central pipe to provide a water inlet passage communicating with said water inlet connection,

a fourth outer pipe concentric with and spaced outwardly from said third inner pipe to provide a water outlet passage,

a water outlet connection on said fourth outer pipe communicating with said water outlet passage,



a nozzle head connected to the lower portions of said fourth outer and central second pipes and including water cooling passages communicating with said water inlet and outlet passages,

a gas inlet tube connected to said top plate to provide a gas inlet into said enlarged upper chamber,

electrical cable means supported within said gas inlet tube and extending within said second central pipe,

a tubular sensor support means supported on and projecting outwardly from said nozzle head,

said central second pipe communicating with said tubular sensor support means and said electrical cable means extending within said sensor support means, and

said sensor support means being adapted to connect and support a sensor device connected to said cable means.

4,272,990

DEVICE FOR THE MEASUREMENT OF ACOUSTIC REVERBERATION TIME AND METHOD

Klaus Hiemann, Isernhagen, and Jost-Michael Haase, Burgwedel, both of Fed. Rep. of Germany, assignors to Polygram GmbH, Hanover, Fed. Rep. of Germany

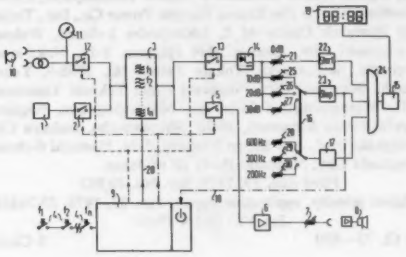
Filed Jul. 25, 1979, Ser. No. 60,375

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1978, 2832791

Int. Cl.³ G01H *7/00*

U.S. Cl. 73—586 **12 Claims**

1. In apparatus for measuring the acoustic reverberation time of an acoustic space, having means for generating a sound frequency signal, a loudspeaker for exciting said acoustic space, a transducer for responding to acoustic energy within said space, and a time measuring device for measuring said acoustic reverberation time, the combination comprising; a plurality of band-pass filters each having a pass band of approximately one-third octave, means for connecting the input of a selected one of said filters to said sound generator and the output of said selected filter to said loudspeaker, and means for



alternately connecting the input of said filter to said transducer and the output of said filter to said reverberation time measuring device.

4,272,991

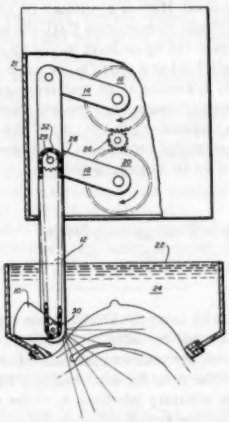
SCANNING METHOD AND APPARATUS

Robert W. Cribbs, Placerville, Calif., assignor to Litton Industrial Products, Inc., Beverly Hills, Calif.

Filed Feb. 9, 1979, Ser. No. 10,894

Int. Cl.³ A61B *10/00;* **G01N** *29/04*

U.S. Cl. 73—621 **8 Claims**



1. A scanner for use in an ultrasonic imaging system and of the type for translating a transducer assembly along a path of successive positions, each position being angularly referenced to a center of translation, wherein the scanner comprises:

means for rotating the transducer assembly about a center of rotation which is offset from the center of translation.

4,272,992

TORSIONAL VIBRATION MONITORING METHOD FOR ROTATING SHAFT SYSTEM

Ichiji Shima; Tatsuo Yamamoto; Shigeru Yoshibayashi; Hiroshi Teshima, all c/o The Kansai Electric Power Co., Inc., Technical Research Center of 2, Ichinotsubo 1-chome, Wakaoji, Amagasaki City, Osaka; Akio Hizume, 8-11, Naka-machi 1-chome, Setagaya-ku, Tokyo; Tetsuo Iki, 1998-5, Yokoomachi, Nagasaki City, Nagasaki Pref.; Takashi Yamamoto, 347, Motomurago, Tokitsu-cho, Nishisonogi-gun, Nagasaki Pref.; Kyozo Kanamori, 16-10, Shiraiwa-cho, Isahaya City, Nagasaki Pref., and Kenzo Noguchi, 5-24, Nameshi 6-chome, Nagasaki City, Nagasaki Pref., all of Japan

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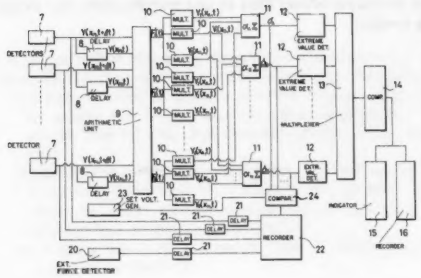
Claims priority, application Japan, Jun. 23, 1978, 53-76131
Int. Cl.[3] G01N *29/04*
U.S. Cl. 73—650 5 Claims



1. A torsional vibration monitoring method for a rotating shaft system wherein a torsional vibration Y(x,t) produced in the rotating shaft system is a sum of modal vibrations $Y_i(x,t)$, each of the modal vibrations is a product of vibration mode types $G_i(x)$ and vibration mode components $H_i(t)$, the vibration mode components $H_i(t)$ is a product of vibration amplitudes $F_i(t)$ and periodic components $E_i(t)$, the torsional vibration Y(x,t) is a sum of the up to 2n-th modal vibrations and the vibration amplitude $F_i(t)$ at a time t is the same as $F_i(t+\Delta t)$ at a time delayed by a minute at Δt and represented by $F_i'(t)$, comprising the steps of measuring torsional vibrations $Y(x_{pk},t)$ with detectors at positions $x_{pk}(k=1 \ldots n)$ of the rotating shaft system obtaining vibration amplitudes $F_i'(t)$ from 2n simultaneous equations of 2n-th degrees including:

$$\begin{cases} Y(x_{pk},t) = \sum^{2n} G_i(x_{pk}) \cdot E_i(t) \cdot F_i(t) \\ Y(x_{pk}, t+\Delta t) = \sum^{2n} G_i(k_{pk}) \cdot E_i(t+\Delta t) \cdot F_i(t) \end{cases}$$

in arithmetic means by using the known mode types $G_i(x_{pk})$ up to the 2n-th, the known periodic components $E_i(t)$ up to the 2n-th, and the known periodic components $E_i(t+\Delta t)$ up to the 2n-th after the minute time Δt; and obtaining torsional vibrations $Y(x_j,t)$ at the arbitrary positions x_j of the rotating shaft system with multiplying means by using the known vibration amplitude $F_i'(t)$, the known vibration mode types $G_i(x_j)$ and the periodic components $E_i(t)$ according to the equation:

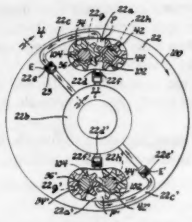
$$Y(x_j,t) = \sum^{2n} G_i(x_j) \cdot E_i(t) \cdot F_i'(t).$$

4,272,993

HYDRAULICALLY CONTROLLED DIFFERENTIAL

Leonard F. Kopich, Madison Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 11, 1978, Ser. No. 950,418
Int. Cl.[3] F16H *1/42, 1/44*
U.S. Cl. 74—711 4 Claims



1. In a planetary gear differential having a pair of side gears, a pair of composite planet gears rotatably carried by a rotatable carrier, said pair of composite planet gears including meshing impeller gears and drive gears meshing respective side gears, improved hydraulic control means for limiting the differential speed of the side gears comprising:

a closed hydraulic circuit including a gear pump chamber having the meshing impeller gears disposed therein, and

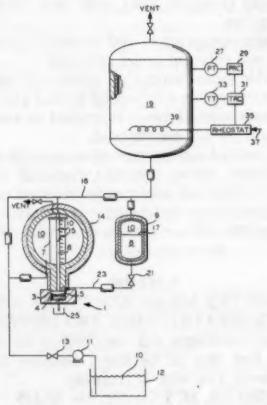
a pair of opposed unidirectional restrictions located on opposite sides of the gear pump chamber.

4,272,994

CONSTANT PRESSURE APPARATUS AND METHOD

Edwin E. Reed, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 1, 1979, Ser. No. 44,810
Int. Cl.[3] G01N *3/10*
U.S. Cl. 73—807 3 Claims



1. An apparatus or maintaining a constant elevated liquid pressure in a small, liquid filled vessel, said apparatus comprising:

(a) a small, liquid filled vessel, said small vessel requiring substantially constant pressure as part of a testing system;

(b) in open communication therewith a vessel having a volume of about 20 to about 100 times the volume of said small vessel;

(c) means for filling said vessels with liquid at a constant pressure; and

(d) means for sensing and manipulating the temperature of liquid in said larger vessel to maintain a substantially constant pressure within the apparatus.

4,272,995

IONIZATION FLOW METER

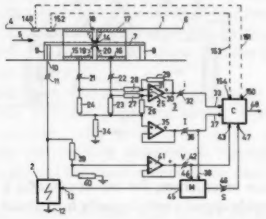
Marten P. Weistra, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 4, 1979, Ser. No. 45,043

Claims priority, application Netherlands, Jun. 26, 1978, 7806827

Int. Cl.³ G01F *1/56*

U.S. Cl. 73—861.09 **17 Claims**



1. In an ionisation flow meter for gases in which an ion beam is produced between an anode and a cathode and is deflected as a result of the passage of the gas to provide first and second currents determined by the deflection of the ion beam, the improvement comprising, a high-voltage source connected to the anode and cathode for generating an ion current therebetween, and a measuring device for measuring the deflection and for producing a signal quantity which is proportional to the gas flow, the measuring device comprising a voltage measuring device for measuring the voltage V between the anode and cathode, a first current measuring device for measuring the total ion current I, a second current measuring device for deriving a difference current i which is determined by the difference of said first and second currents to provide a measure of the ion beam deflection, a calculating unit including operational amplifiers and multiplication circuits and having inputs for the quantities measured and an output for said signal quantity, a modulator coupled to the high-voltage source which periodically varies the operating point of the current I and the voltage V on the I-V curve by an amount dI for the current and dV for the voltage and supplies a signal to a further input of the calculating unit which is a measure of the slope S, the slope S being defined as dI divided by dV at the operating point, the calculating unit deriving from the measured quantities said signal quantity which is proportional to the flow rate of the gas and which is independent of pressure and temperature, using a corona current formula I as a function of V and a deflection formula i as a function of the deflection.

4,272,996

SCOTCH YOKE HAVING A CURVED TRACK

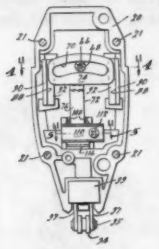
William D. Sauerwein, Joppa, Md., assignor to Black & Decker Inc., Newark, Del.

Filed Jun. 19, 1979, Ser. No. 50,044

Int. Cl.³ B27B *11/02*; F16H *21/18*

U.S. Cl. 74—50 **12 Claims**

1. In a reciprocating scotch yoke drive mechanism for a power tool including a crank plate, an eccentrically located crank pin secured to said crank plate and drivingly disposed within an aperture in a yoke member having a shaft portion and a transversely extending head portion containing said aperture, and bearing means defining a support for said shaft for determining the reciprocal axis for said yoke member; the improvement wherein said aperture is curvilinear and wherein the radius of curvature of said aperture is equal to the distance between said crank pin and a point on the axis of said shaft



adjacent said bearing means when said yoke is at its mid-stroke position.

4,272,997

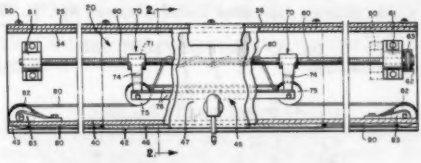
DRIVE MECHANISM

Willis G. Groth, Geneva, Ill., assignor to H. A. Phillips & Co., St. Charles, Ill.

Filed Aug. 17, 1978, Ser. No. 934,407

Int. Cl.³ F16H *27/02*

U.S. Cl. 74—89.22 **5 Claims**



1. A mechanism for converting rotary to linear movement, comprising:

a. a drive shaft having external threads formed on a section thereof,

b. means for rotating said drive shaft about its own axis,

c. internally threaded bracket means mounted on said threaded drive shaft section for movement therealong as said drive shaft is rotated,

d. said bracket means having cable direction changing means mounted thereon,

e. drive cable means having a cable portion wrapped around said threaded drive shaft section and having oppositely extending cable portions extending generally perpendicularly away from said drive shaft,

f. said oppositely extending cable portions adapted to be connected to said driven means, and

g. said oppositely extending cable portions tracking around said direction changing means whereby said cable portions then extend generally parallel to said drive shaft.

4,272,998

DRIVE MECHANISM

Erwin F'Geppert, Novi, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 4, 1980, Ser. No. 118,044

Int. Cl.³ F16H *21/44, 21/54*

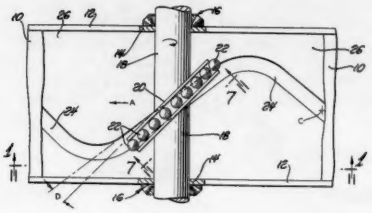
U.S. Cl. 74—99 R **7 Claims**

1. Means to transmit motive power between two movable machine elements, one of which rotates about a fixed axis and the other of which moves along a path perpendicular to said axis, comprising:

a. a planar member mounted on the first-named element to rotate about said axis and having a peripheral groove,

b. a plurality of rollers disposed in said peripheral groove,

c. a track in the second-named element adapted to cooperate with the rollers of the planar member to transmit force between the planar member and the track, and



d. the planar member being skew mounted on the first-named element and having a non-circular shape whereby said rollers are always in engagement with the track as the first-named element rotates and the track moves.

4,272,999

FLUID PRESSURE OPERATED ACTUATOR

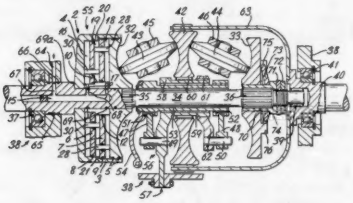
Forbes G. B. Perry, Forest Row, England, assignor to National Research Development Corporation, London, England

Filed Apr. 5, 1979, Ser. No. 27,595

Claims priority, application United Kingdom, Apr. 11, 1978, 14144/78

Int. Cl.³ F16H *17/00;* **F01B** *7/04*

U.S. Cl. 74—200 **19 Claims**



1. A fluid pressure operated actuator comprising a cylinder having a cylindrical portion and a cylinder end portion and a main piston movable axially, in sealing relation, within the cylinder characterized by the following features in combination:

(a) a pair of auxiliary piston members received within said cylinder between said main piston and the cylinder end portion,

(b) sealing means permitting limited passage of fluid past the edges of the auxiliary piston members,

(c) a pressurized zone between a first member of said pair of auxiliary piston members and the cylinder end portion,

(d) another pressurized zone between a second member of the pair of auxiliary piston members and said main piston,

(e) a vented zone between the members of the pair of auxiliary piston members,

(f) mechanical linkage means coupling, to the main piston, the member of the pair of auxiliary piston members which is nearest to the cylinder end portion,

(g) mechanical linkage means coupling to the cylinder end portion, the member of the pair of auxiliary pistons which is nearest to the main piston,

(h) duct means for the introduction of pressurized fluid into the pressurized zones of paragraphs (c) and (d), above,

(i) an escape orifice through which fluid, accumulating in said vented zone, may escape.

4,273,000

DRIVE MECHANISM FOR A DRUM

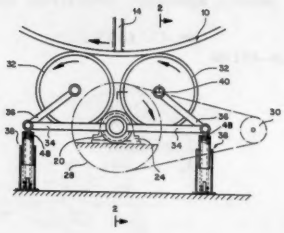
Alfred Schmid, Schöfflisdorf, Switzerland, assignor to Bucher-Guyer AG, Zürich, Switzerland

Filed Aug. 11, 1978, Ser. No. 932,926

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1977, 2738172

Int. Cl.³ F16H *13/02;* **B28C** *5/18*

U.S. Cl. 74—206 **11 Claims**



1. A drive mechanism, for use in rotating a relatively large drum rotatable about a substantially horizontal axis of rotation, comprising in combination:

spring-support means, said drum being supported rotatably from said spring-support means, and

drive means including an energizable rotor, first guide means resiliently and rotatably supporting said energizable motor from said spring-support means, said motor being in operative frictional contact with the circumference of said drum, for rotating said drum when energized, an energizing wheel in frictional driving connection with said energizable rotor for energizing it to revolve in a predetermined rotational direction, so as to drive said drum in a rotational direction opposite to said predetermined rotational direction, and second guide means rotatably supporting said energizing wheel from said spring-support means.

4,273,001

GEAR TRANSMISSION

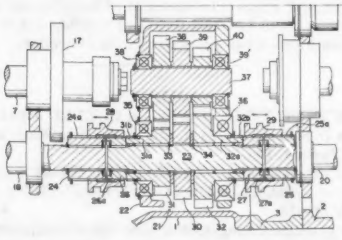
Masayoshi Miyahara; Morimitsu Katayama, both of Sakai, and Hiroyuki Kisaka, Sennan, all of Japan, assignors to Kubota, Ltd., Naniwa, Japan

Filed Mar. 26, 1979, Ser. No. 24,030

Claims priority, application Japan, May 27, 1978, 53-73313; Jun. 7, 1978, 53-77472

Int. Cl.³ F16H *3/08, 37/06;* **G05G** *9/12*

U.S. Cl. 74—359 **4 Claims**



1. A gear transmission comprising:

a driving transmission;

a driven transmission shaft coaxial with said driving transmission shaft;

a speed change shaft disposed between and coaxial with said

transmission shafts and provided with three speed change gears having different diameters from one another, namely first and second freely rotatable gears and a fixed gear arranged between said rotatable gears;

an auxiliary speed change shaft provided with three fixed auxiliary speed change gears having different diameters from one another and constantly meshing with said three speed change gears on said speed change shaft respectively;

a first tube member secured to a rear end portion of said driving transmission shaft and having a first meshing portion with splines on an outer periphery thereof;

a second tube member secured to a front end portion of said driven transmission shaft and having a second meshing portion with splines on an outer periphery thereof;

third and fourth tube members secured to rear and front end portions of said speed change shaft and having third and fourth meshing portions with splines on outer peripheries thereof respectively;

first and second boss portions formed as integral extensions of said freely rotatable gears and having fifth and sixth meshing portions with splines on outer peripheries thereof, said six meshing portions all having the same outer diameter and the outer splines of the same shape and number;

a first tubular clutch member with splines on an inner periphery thereof slidable from said first tube member to said first boss portion through said third tube member and switchable between a position to mesh with said first and third meshing portions, a position to mesh with said first and fifth meshing portions, and a neutral position, and

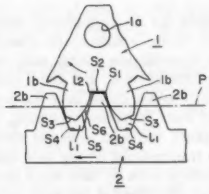
a second tubular clutch member with splines on an inner periphery thereof slidable from said second tube member to said second boss portion through said fourth tube member and switchable between a position to mesh with said second and fourth meshing portions, a position to mesh with said second and sixth meshing portions, and a neutral position.

4,273,002

FACE GEAR ASSEMBLY

Hiroomi Ogasawara, 3821-4, and Masaomi Ogasawara, 3833, both of Yamakita, Yamakitamachi, Ashigarakami-gun, Kanagawa-ken, Japan

Filed Mar. 12, 1979, Ser. No. 20,110
Int. Cl.³ F16H *55/06, 1/12*
U.S. Cl. 74—462 **1 Claim**



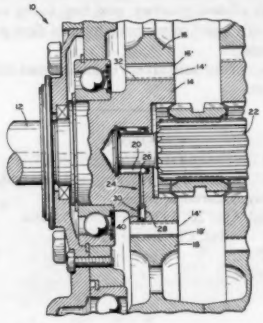
1. A face gear assembly comprising a face gear having teeth arranged in annular disposition and directed in the direction parallel to the rotational axis of the face gear, each of said teeth having a substantially flat crest, and a pinion having teeth in engagement with said teeth of the face gear, said pinion having a root surface between two adjoining teeth thereof, said crest being formed to contact the root surface between two adjoining teeth of the pinion which are in mesh with the tooth of said crest.

4,273,003

CHECK VALVE BEARING LUBRICATOR

Donald C. Schultz, 404 Northdale Dr., Toledo, Ohio 43612

Filed Mar. 12, 1979, Ser. No. 19,809
Int. Cl.³ F01M *9/10*; F16H *57/04*
U.S. Cl. 74—467 **10 Claims**



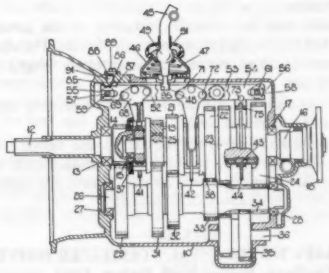
1. In a gear having a bearing surface contained therein for rotatable mounting thereof, the gear including a bore extending radially from gear teeth thereon to said bearing surface; a bearing lubricator within said gear comprising said bore and a check valve including a dynamically operative ceramic element within said bore, whereby oil may be forced radially inwardly through said bore and check valve, via dynamic mesh of said gear teeth with gear teeth of a second gear.

4,273,004

GEAR SELECTOR MECHANISM

William M. Morrison, Shandon, 107 Coalway Rd., Wolverhampton, West Midland, England, and Philip J. Mazziotti, 2826 Falmouth Rd., Toledo, Ohio 43615

Filed Jul. 23, 1979, Ser. No. 60,117
Claims priority, application United Kingdom, Jul. 25, 1978, 31079/78
Int. Cl.³ G05G *9/14*
U.S. Cl. 74—473 R **7 Claims**



1. A gearbox having an output shaft and an axis parallel to said output shaft, said gearbox comprising a main housing for enclosing gears and a bell housing for positioning adjacent an associated clutch, said bell housing secured to said main housing,

first roller mounting means located in said main housing, second roller mounting means located in said bell housing, a first set of rollers mounted on said first roller mounting means, a second set of rollers mounted on said second roller mounting means,

a plurality of shift bars operatively connected to shift elements for engaging and disengaging said gears, each of

said shift bars extending parallel to said axis, each of said shift bars having a rectangular cross-section and having first and second axially spaced ends, said first ends of each of said shift bars mounted on said first set of rollers, said second ends of each of said shift bars mounted on said second set of rollers, at least one of said first and second ends of each of said shift bars defining a slot to facilitate the assembly of said gearbox, said bars being constrained to substantially axial movement by said first and second sets of rollers,

and control means for selectively engaging and axially moving shift bars.

4,273,005

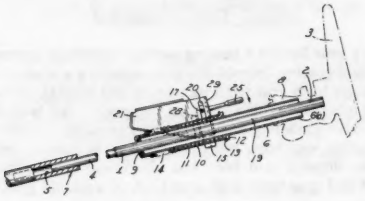
STEERING COLUMN ASSEMBLY

Derek W. Strutt, Great Baddow, England, assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 20, 1979, Ser. No. 14,464

Int. Cl.³ B62D *1/18*

U.S. Cl. 74—492 **11 Claims**



1. A steering column assembly comprising;

an upper rotatable shaft section adapted at one end to carry a steering wheel;

a lower rotatable shaft section adapted at one end for connection to a steering linkage and connected to the upper shaft section for rotation therewith about a common steering axis;

the upper shaft section being axially movable relative to the lower shaft section, whereby the length of the column may be adjusted;

a jacket surrounding and rotatably supporting the upper shaft section;

a deformable member coaxially mounted on the jacket and connected to the jacket at one end, thereby the deformable member being capable of altering its length under impact loads;

a clamp extending around the deformable member towards the other end thereof; and

a mounting bracket carrying the clamp and being deformable to allow the clamp to move under impact loads and to increase the clamping force on the deformable member.

4,273,006

AIRCRAFT HORIZONTAL STABILIZER DRIVE

James R. Woodbury, Rolling Hills Estates, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Sep. 27, 1978, Ser. No. 946,148

Int. Cl.³ F16H *1/44*; F16D *9/00*; G05G *7/00*

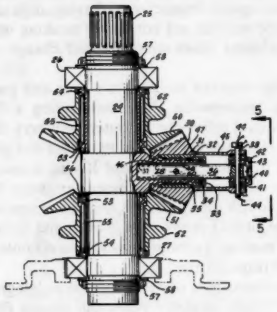
U.S. Cl. 74—710.5 **15 Claims**

1. In an airplane, an apparatus for the transmission of mechanical power to a first and second driven means which, in turn, drive a single control surface which comprises:

an epicylic gear train of the differential motion type, said gear train comprising two driven gears and a pinion gear with said pinion gear mounted for rotation on an axle which is attached to an arm which is turning about the axis of at least one of said driven gears;

means for retaining said pinion gear to said pinion axle so that said pinion gear will rotate on said pinion axle only after a predetermined torque is applied to said pinion gear;

means for attaching said first and second driven means to one each of said driven gears;



whereby an input torque applied to said epicyclic gear train causes said arm with said pinion gear to rotate, driving both driven gears without relative movement between the three gears until a predetermined differential torque is experienced between said two driven gears which allows the pinion gear to rotate on its axle.

4,273,007

TRANSMISSION FOR AGRICULTURAL TRACTOR

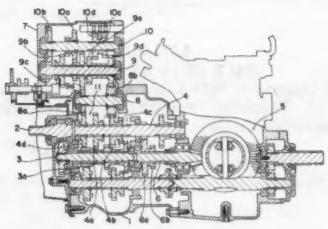
Mitsuhiro Sato; Hiroshi Itatani, and Kenji Matsuda, all of Sakai, Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Apr. 2, 1979, Ser. No. 26,105

Claims priority, application Japan, Apr. 21, 1978, 53-53779[U]; Apr. 21, 1978, 53-53783[U]

Int. Cl.³ F16H *3/02*

U.S. Cl. 74—745 **4 Claims**



1. A transmission for an agricultural tractor comprising a main transmission casing, a main speed change means disposed within said main transmission casing, said main speed change means including first, second, and third shift gears for main speed changes, a constant drive gear for power take-off disposed within said main transmission casing, said first, second, and third shift gears and said constant drive gear mounted within said main transmission casing on a main common shaft supported at opposite ends by said main transmission casing, said constant drive gear fixed in the axial direction for relative rotation on said common shaft and said first, second, and third shift gears being splined on said common shaft for axial movement relative thereto, an opening in one side of said main transmission casing, said first, second, and third shift gears and said constant speed gear being disposed in relative positions in proximity to said opening in said main transmission casing and exposed thereby; an auxiliary speed change means supported within an auxiliary transmission casing, said auxiliary transmission casing removably secured to said main transmission casing relative to said opening therein, said auxiliary speed change

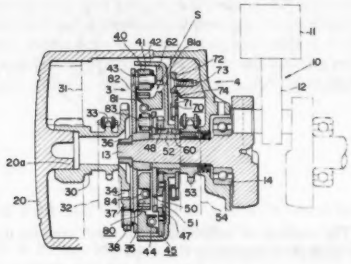
means including an input gear arranged to mesh with said constant drive gear and an output gear so arranged to mesh with one of said shift gears on said main common shaft, said input gear and said output gear mounted on an auxiliary common shaft supported by said auxiliary transmission casing, said output gear being freely rotatable relative to said auxiliary common shaft and said input gear being splined to said auxiliary common shaft for rotation therewith.

4,273,008

AUTOMATIC TRANSMISSION

Takeo Ishihara, Asaka; Tsutomu Hayashi, Hoya, and Masumi Hamane, Kawagoe, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 29, 1979, Ser. No. 53,325
Claims priority, application Japan, Jul. 4, 1978, 53-81152
Int. Cl.³ F16H *3/74, 3/44;* F02N *5/02*
U.S. Cl. 74—752 E **14 Claims**



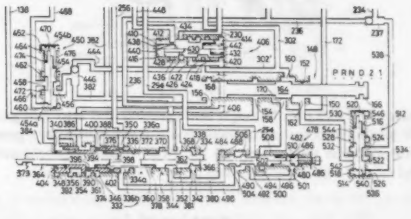
1. An automatic transmission, comprising:
a drive shaft (13) driven from a drive source (10);
a centrifugal first clutch (40);
a planetary gear mechanism (45);
an output shaft (52) from which power from said drive shaft (13) is taken out through said planetary gear mechanism (45);
said drive shaft (13) being provided to project from said drive source, with a proximal end of said drive shaft being supported by a bearing (14) proximal said drive source (10);
said planetary gear mechanism (45) including an outermost ring gear (46), a central sun gear (48), and planet gears (47) disposed between and meshing with said ring and sun gears;
said drive shaft (13) being coupled to one of said three different types of gears of said planetary gear mechanism (45) through said centrifugal first clutch (40);
said output shaft (52) being coupled to another one of said three different types of gears;
said planetary gear mechanism (45) being mounted on said drive shaft (13) with said sun gear (48) at the center of said planetary gear mechanism being fitted on said drive shaft (13);
said centrifugal clutch (40) and planetary gear mechanism (45) being disposed on said drive shaft so as to closely face each other; and
a one-way clutch (70) coupled on one hand to the remaining one of the three different types of said gates (46, 47, 48) of said planetary gear mechanism (45) coupled to neither said drive shaft (13) nor said output shaft (52), and on the other hand to a stationary member (20).

4,273,009

TRANSMISSION THROTTLE VALVE FOR USE IN HYDRAULIC CONTROL SYSTEM OF AUTOMATIC POWER TRANSMISSION

Kazuyoshi Iwanaga, Yokohama; Kazuhiko Sugano, Tokyo, and Kunio Ohtsuka, Yokohama, all of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Feb. 2, 1979, Ser. No. 9,031
Claims priority, application Japan, Sep. 29, 1978, 53-120981
Int. Cl.³ B60K *41/00, 41/06*
U.S. Cl. 74—869 **3 Claims**



1. In a hydraulic control system of an automatic power transmission for an automotive vehicle having an acceleration producing member movable into and out of a released position producing an idling condition in the engine, a transmission throttle valve for producing a throttle pressure variable with the amount of displacement of the acceleration producing member from said released position thereof, comprising
a first movable member engaging the acceleration producing member through a mechanical linkage for being moved in a first direction when the acceleration producing member is moved away from the released position thereof, the first movable member being formed with a pressure acting area to be acted upon by said throttle pressure for urging the first movable member in said first direction;
a second movable member arranged and movable in series with said first movable member and formed with a pressure acting area to be acted upon by said throttle pressure for urging the second movable member to move in a second direction opposite to the first direction, the pressure acting area of the first movable member being larger than the pressure acting area of the second movable member;
first resilient biasing means engaging the first and second movable members for urging the first and second movable members to move in the second and first directions, respectively, with a force variable with the spacing between the first and second movable members; and
second resilient biasing means incorporated into said mechanical linkage for urging the first movable member to move in the second direction with a force variable with the amount of displacement of the acceleration producing member away from said released position thereof.

4,273,010

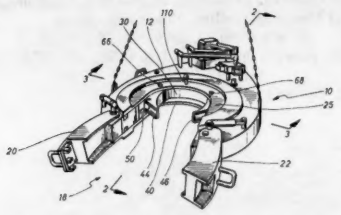
POWER TONG

Garth M. Farr, 1620 Magnolia La., Kingwood, Tex. 77339; Terence D. McCoy, Site 16, Box 1, R.R.1, Spruce Grove, Edmonton, Alberta, and Jiri Diask, 121 Tudor La., Edmonton, Alberta, all of Canada

Filed Jul. 31, 1979, Ser. No. 61,619
Int. Cl.³ B25B *17/00*
U.S. Cl. 81—57.18 **10 Claims**

1. In a power tong of the type having a frame with a pipe-receiving throat and mounting a rotatable portion, a rotary gear mounted for rotation within the frame, means for rotatably driving the rotary gear, cam means on the inner surface of said rotary gear and pipe-gripping means including gripping elements and cam follower means for engaging said cam means

and urging said gripping elements into engagement with a pipe section, the improvement comprising at least one arcuate groove formed in a surface of said rotary gear, an aperture in the frame rotatable portion residing proximate said groove and



means sized to pass through said opening and into said groove for joining said frame rotatable portion and said rotary gear for joint rotation when the cam follower means is proximate the end of the cam means during pipe gripping operations.

4,273,011

DEVICE FOR TURNING THE NUTS ON STUDS FOR CLOSING A PRESSURE VESSEL

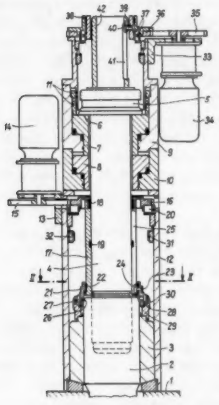
Gerhard Exner, and Volfango Festinori, both of Berlin, Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Nov. 26, 1979, Ser. No. 97,798

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1978, 2852105

Int. Cl.[3] **B25B** *29/02*

U.S. Cl. 81—57.38 **7 Claims**



1. In a device for turning nuts, tensioning nuts, and tensioning bolts on studs arranged on a pitch circle for closing a pressure vessel, in which the stud or a tensioning bolt connected thereto may extend substantially beyond a nut seated on the pressure vessel, the device comprising a tensioning assembly having a central space in a supporting body for receiving a stud, a nut and a tensioning bolt, when one is used, and which carries separate turning units for reversibly driving a pinion meshing with the teeth of a drive bushing held in the support body and surrounding the stud to transmit torque to the nut and for applying tension to the stud, the improvement comprising:

the nut being connected to one half of a positive, torque-transmitting clutch which can be pulled apart in the axial direction,

the second half of the clutch being supported for motion lengthwise on the drive bushing while being secured against rotation relative to the bushing; and

the drive bushing being guided on the stud and being provided, at the end away from the nut, with external teeth for meshing with the pinion.

4,273,012

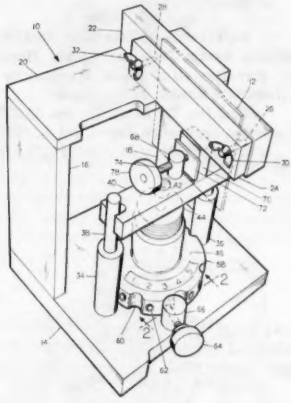
FOAM SPECIMEN APPARATUS AND METHOD

Edson C. Bates, Toledo, Ohio, and Jeanne A. King, Huntington, N.Y., assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Jan. 7, 1980, Ser. No. 109,946

Int. Cl.[3] **B26D** *4/50, 7/08*

U.S. Cl. 83—17 **10 Claims**



10. The method of preparing foam sheet samples for microscopic inspection including the steps of;

(a) severing a sample of foam sheet material from a larger sheet,

(b) grasping one end of said sample with first clamp means so that the position of said sample is fixed with respect to said first clamp means,

(c) grasping the opposite end of said sample with second clamp means so that the position of said sample is movable with respect to said second clamp means,

(d) moving said first and second clamp means relative to one another so that said sample protrudes beyond a cutting surface on said first clamp means,

(e) severing that portion of the foam sample that protrudes beyond said cutting surface,

(f) advancing said second clamp means toward said first clamp means so that a prescribed amount of said sample protrudes beyond said cutting surface,

(g) severing the prescribed amount of said sample so that it can be mounted for microscopic examination.

4,273,013

SLICING MACHINE

Robert L. Artin, Menomonee Falls, and Allen C. Eimerman, Milwaukee, both of Wis., assignors to Sunbeam Corporation, Chicago, Ill.

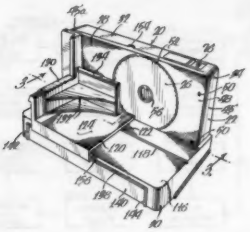
Filed Jul. 9, 1979, Ser. No. 55,861

Int. Cl.[3] **B26D** *4/28*

U.S. Cl. 83—167 **10 Claims**

1. A slicing machine for use in the home for slicing foodstuffs, comprising, a housing containing an electric motor in driving connection with a flat circular blade, said blade being supported for rotation about its central axis and positioned in a recess in a housing wall, a stop plate mounted in said housing adjacent said blade and movable substantially perpendicualr to said blade to select a thickness of a slice of foodstuff being

sliced, an opening formed in said housing adjacent said blade and said stop plate through which sliced food is discharged, the portion of said housing defining the lower edge of said opening being formed with a food dish receiving member which guides said sliced food through said opening onto a dish, said food dish receiving member including a first portion to position said dish and a second portion extending beyond said



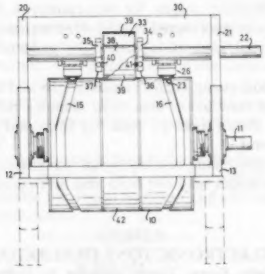
first portion to direct liquids from said food onto said dish, a table having a surface for supporting food to be moved toward and across said blade, said table being detachably mounted to the housing with said surface being above the lower edge of said blade and at a substantially right angle to said blade during operation, means detachably mounting said table in an alternative storage position partially enclosing said housing and being positioned with said surface substantially parallel to said blade.

4,273,014

DEVICE FOR CUTTING OUT BLANKS FROM A WEB OF MATERIAL

Ernst G. S. Edling, Mölnlycke, Sweden, assignor to Mölnlycke AB, Goteborg, Sweden

Filed May 21, 1979, Ser. No. 41,181
Claims priority, application Sweden, May 25, 1978, 7805988
Int. Cl.³ B26D 1/28
U.S. Cl. 83—333 **4 Claims**



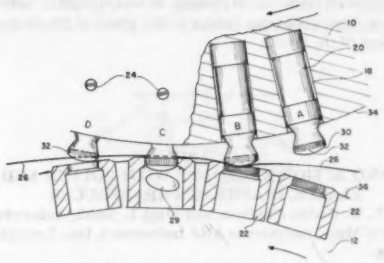
1. Device for cutting out formed pieces from thin web material, comprising a roller over which the web is led and means acting against the roller to press the web against the roller, characterized in that in the roller there is cut out a groove corresponding to the desired contours of the formed piece, the groove being disposed about the roller in a path whose position varies lengthwise of the rollers, and that a member is disposed to press against the edge of the groove and thereby cut through the material web, and means mounting said member for oscillatory movement lengthwise of said roller to follow said groove upon rotation of said roller.

4,273,015

DOME HEAD PUNCH

Donald R. Johnson, 5019 Mortier Ave., Orlando, Fla. 32809

Filed Jun. 4, 1979, Ser. No. 44,983
Int. Cl.³ B26F 1/10
U.S. Cl. 83—670 **5 Claims**



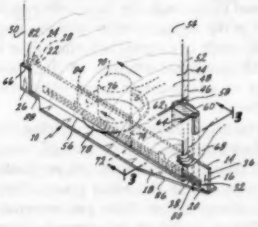
1. A novel domed head punch adapted for use on the periphery of a rotary punch ring of a machine that also utilizes a die ring rotating at the same speed at a location closely adjacent the punch ring, the head of said punch being arranged to enter a corresponding serrated die on the die ring during co-rotation of the punch ring and die ring, and during such entry, having penetrating contact with the serrations of the die, thus to effect the punching of holes in sheet material passing between the punch and die, the domed head of said punch causing somewhat of a stretching of the sheet material residing adjacent the die immediately prior to the punching of the sheet material by the punch and die, with this stretching of the sheet material causing the punched portion to readily leave the main portion of the sheet material passing between punch and die, thus diminishing the likelihood of "hangers" being created.

4,273,016

DOOR CUTTING TEMPLATE

Mark W. Murdock, P.O. Box F, Lake Arrowhead, Calif. 92352

Filed Jan. 30, 1980, Ser. No. 116,905
Int. Cl.³ B27B 9/04
U.S. Cl. 83—743 **11 Claims**



1. A door cutting guide used in conjunction with a saw and a door of the type having two parallel face surfaces separated by two elongated side edges and a top and bottom edge which comprises:

an elongated first member sized to fit across the width of one of the face surfaces of said door, said elongated member including two elongated parallel faces, one of which is capable of fitting flush against said face surface of said door, said elongated member including a lower edge capable of resting on a floor and supporting said elongated member above said floor adjacent to said door;

said first member including an elongated slot means extend-

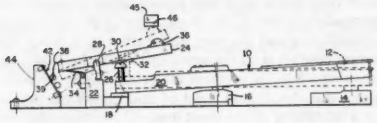
ing between said two parallel faces along a portion of the length of said elongated member, said slot means forming an opening for the blade of said saw allowing said blade of said saw to pass through said elongated member and contact said door;

a retaining means located on one end of said elongated member and capable of retaining said one end of said elongated member in a fixed position with respect to said door with respect to movement of said elongated member in a direction perpendicular to the plane of the face surfaces of the door.

4,273,017
PIANO ACTION KEYBOARD WITH ROLLER AND ELASTIC DIAPHRAGM TRANSDUCER

Philip V. W. Dodds, Needham, and Mark L. Smith, Auburndale, both of Mass., assignors to ARP Instruments, Inc., Lexington, Mass.

Filed Feb. 27, 1979, Ser. No. 15,729
Int. Cl.³ G10H *1/02, 1/34*
U.S. Cl. 84—1.1 **6 Claims**



1. Electrical circuit controller usable in electric musical instrument keyboard controls and like applications responsive to a plurality of independent controlling movements comprising,

means defining a circuit portion comprising at least a triple layering of bottom, middle and top superimposed films of resilient plastic, the middle such film having multiple openings therein in a linear array,

the films being tensioned and arranged so that portions of the bottom and top films have two relative positions, one of which is close proximity including contact or near contact of the two films and the other of which is lesser proximity, one of said positions being the at-rest position of the films portions in the region of each such opening and the other being the result of external actuation to at least one of the films, the positional changes of film portions in other openings of said aperture array being similarly sequentially effected,

the film arrangement at each such opening including a capability of varying the form or time of assuming a form of the said films resulting from the application of external force depending on the exact point of application force and rate of application of the said external actuation,

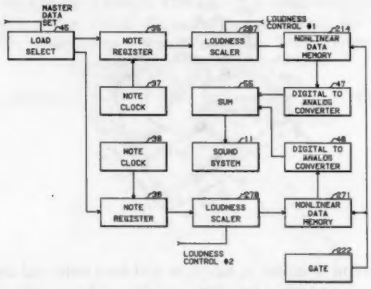
means defining electrical components located in at said openings and each having multiple states in relation to an electrical circuit containing such components including at least a first state when the top and bottom films have said at rest positions and a second state in the other position and including in at least some of said openings, a third state resulting from variation of form of the said position due to variation of location, force and rate of said external actuation, and

means defining a separate external force actuating linkage aligned with each opening of the linear array and arranged for independent actuation of the film portions at each such opening.

4,273,018
NONLINEAR TONE GENERATION IN A POLYPHONIC TONE SYNTHESIZER

Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co., Ltd., Hamamatsu, Japan

Filed Jun. 2, 1980, Ser. No. 155,327
Int. Cl.³ G10H *1/06, 1/02*
U.S. Cl. 84—1.22 **12 Claims**



1. In a musical instrument having one or more tone generators, in which a plurality of data words corresponding to the amplitudes of a corresponding number of evenly spaced points defining the waveform of a musisical tone are computed and transferred sequentially to a digital-to-analog converter at a rate proportional to the pitch of the tone being generated, apparatus for generating tones having a variable spectral content comprising;

a first means for computing transfer data values during the first subcomputation cycle of a sequence of computation cycles each comprising a first and a second subcomputation cycle,

a first memory means for storing said transfer data values,

a second means for computing data values of a master data set during said second subcomputation cycle,

a second memory means for storing said master data set,

a third memory means for storing data to be thereafter read out,

a first data transfer means whereby said master data set is read out of said second memory means and stored in said third memory means,

a first addressing means for sequentially and repetitively reading out data stored in said third memory means,

control signal generation means for generating a control signal,

a second addressing means responsive to said control signal and data read out of said third memory means whereby transfer data values are read out from said first memory means, and

means for producing musical signal waveshapes from transfer data values read out from said first memory means.

4,273,019
ELECTRONIC TONE GENERATOR

Mitsuhiro Goto, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

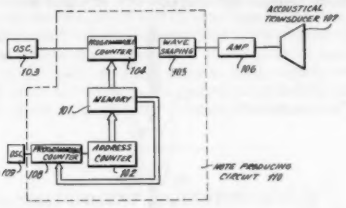
Filed Jul. 10, 1979, Ser. No. 56,155
Claims priority, application Japan, Jul. 11, 1978, 53-84306; Jul. 11, 1978, 53-84308; Jul. 11, 1978, 53-84309; Jul. 11, 1978, 53-84310
Int. Cl.³ G10H *1/043, 1/10*
U.S. Cl. 84—1.24 **29 Claims**

1. An electronic tone generator comprising:

at least one first signal-generating oscillator circuit;

at least two note-producing circuits, each note-producing circuit including a memory circuit for storing note and time data for each note, a first programmable counter

circuit for variably dividing pulses outputted by said first signal-generating oscillator circuit to produce in sequence different notes of selected frequencies and selected durations in response to sequential reading of said data in said memory circuit, the note output of each note-producing circuit being produced independently of the note output



of the other note-producing circuit, but said output notes being interrelated to produce a single musical effect;

means to mix and amplify note wave forms produced by said note-producing circuits; and

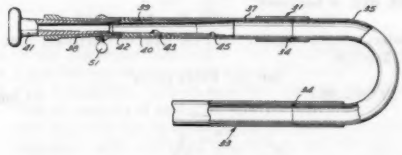
an electroacustic transducer receiving the output of said mixing and amplifying means and outputting audible sound having a special sound effect.

4,273,020

METHOD OF CONSTRUCTING TRUMPET OR OTHER BRASS INSTRUMENT

Ralph A. Happe, 15400 Belgrade St., Apt. 35, Westminster, Calif. 92683

Filed May 24, 1979, Ser. No. 42,109
Int. Cl.³ G10D *7/10*
U.S. Cl. 84—394 **17 Claims**



1. A method of constructing a musical wind instrument having a cup-shaped mouthpiece and a main bore section to correct the intonation of selected notes of the chromatic scale of said instrument comprising:

forming a mouthpipe having a conical-shaped axial aperture and mounted between said mouthpiece and said main bore section; and

forming a zone of increased taper along the length of said conical-shaped aperture, said zone located to coincide with the pressure maximum points of said selected notes of said chromatic scale.

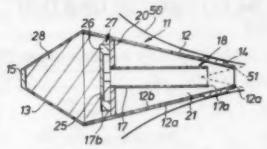
4,273,021

MUTES FOR WIND INSTRUMENTS

Robert D. Mackie, 4 Parkdale Rd., Bakersfield, Nottingham, England

Filed Nov. 8, 1979, Ser. No. 92,488
Int. Cl.³ G10D *9/06*
U.S. Cl. 84—400 **6 Claims**

1. A mute for a wind instrument comprising a hollow shell adapted for fitting in the bell of the wind instrument and having an inlet for collecting the air passing through the instrument and an outlet for directing said air in a direction away from the instrument, the shell being partitioned by a sound absorbent rigid barrier spaced from said inlet to define together with an internal wall surface of the shell a first chamber within the shell, said barrier being spaced from said outlet to define a second chamber within the shell; a baffle mounted on the barrier and having a peripheral portion spaced from the internal wall surface of the shell to define therewith an inlet into said second chamber, the internal wall surface of the shell forming the first chamber being an anechoic surface so that said first chamber defines an anechoic chamber; a tube mounted on the barrier so as to extend towards the inlet of the shell and defining an exit passage from the first chamber through the barrier, the tube directing air exiting from the first



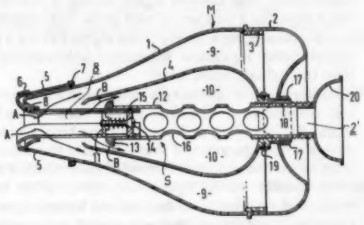
chamber towards the central region of the baffle and serving as an anenergic means to dampen sound waves travelling from the first chamber to the baffle, said baffle directing air exiting from the first chamber towards the portion of the internal wall surface of the shell to be deflected thereby through said inlet to the second chamber, said portion of the shell having an anechoic surface, the second chamber containing a sound insulating material through which air travelling from the inlet of the second chamber to the outlet of the shell has to pass.

4,273,022

INSTRUMENTAL MUTE

Robert E. Bell, 224 Perth Rd., Gants Hill, Ilford, Essex, England

Filed Nov. 21, 1979, Ser. No. 96,313
Int. Cl.³ G10D *9/06*
U.S. Cl. 84—400 **11 Claims**



1. A mute for insertion within the bellmouth of a wind musical instrument comprising: body means enclosing at least one internal chamber, said body means including inlet means permitting sounds from said bellmouth to enter said chamber and outlet means permitting said sounds to exit from said chambers and supporting means including retaining means, adjusting means, sealing means and closure means, said retaining means adapted to retain said mute in said bellmouth; said adjusting means permitting said body means to be adjusted relative to said supporting means in at least two positions; said sealing means selectively (1) acoustically sealing said body means and said bellmouth when said body means is in a first adjusted position, to constrain said sounds to enter said chamber, and (2) spacing said body means from said bellmouth, when said body means is in a second adjusted position, to allow said sounds to both exit exteriorly of said body and enter said chamber, and said closure means selectively (1) opening communication of said sounds to said outlet means, when said body means is in said first position, and (2) closing communication of said sounds to said outlet means, when said body means is in

said second position, whereby when said body means is in said first position, said sounds are constrained to pass into said inlet means, through said internal chamber, and out said outlet means, and when said body means is in said second position, said sounds are allowed to pass exteriorly of said body means as well as into said chamber but not out of said outlet means.

4,273,023

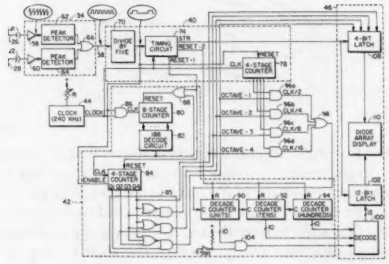
AURAL PITCH RECOGNITION TEACHING DEVICE

Stanley L. Mercer, 3038 Alta Vista Ave., Alameda, Calif. 94501

Filed Dec. 26, 1979, Ser. No. 106,969

Int. Cl.³ G10G *7/02*; G09B *15/02*

U.S. Cl. 84—454 **5 Claims**



1. Apparatus for teaching aural pitch recognition by receiving a musical tone containing a pitch in the form of peak amplitude excursions and by displaying a visual represenation of the pitch, comprising:

means for receiving and detecting the peak amplitude, and for generating therefrom a pulse train having a period and a pulse repetition frequency substantially equal to that of the pitch;

means coupled to the receiving means and responsive to the pulse train for producing therefrom a periodic control signal having a first binary state followed by a second binary state, said control signal having a period substantially equal to a number of said pulse train periods;

means for producing a binary clock signal having a predetermined pulse repetition frequency substantially greater than that of said pulse train;

first counter means operatively coupled to the control means and responsive to the first binary state of said control signal for receiving and counting the binary clock signal during a time duration of said first state to produce therefrom a first count representative of the octave of the pitch;

second counter means operatively coupled to the clock means and responsive to said second binary state and said first count, and for producing a second count indicative of the frequency of said pitch within the octave; and

means coupled to said first and second counter means for receiving the first and second count and for decoding and displaying therefrom a visual representation indicative of the pitch of the received musical tone.

4,273,024

APPARATUS AND METHOD FOR EXTRACTING STUCK AMMUNITION CASES FROM SIZER DIES

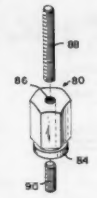
Bob R. Veloni, Rte. 3, P.O. Box 862, Hoquiam, Wash. 98550

Filed Sep. 4, 1979, Ser. No. 71,889

Int. Cl.³ F42B *33/10*

U.S. Cl. 86—1 R **6 Claims**

1. A device for extracting an ammunition case from a sizer die in which said case has become stuck during sizing of said case with a reloading press, said case having a gripping rim and a primer pocket formed at its head, said press including a frame in which said sizing die and a reloading ram are mounted in spaced-apart, coaxial relation, a shell holder carried by said ram having an annular rim on one face received by a mounting slot formed at one end of said ram and a slot at the opposite face of said shell holder adapted to receive said gripping rim; and means for moving said ram between a first position in which said case is inserted in said sizer die and a second position in which said case is withdrawn from said sizer die, said extracting device comprising a generally cylindrical body having an annular rim at one end adapted for insertion in the mounting slot and a screw projecting from the opposite end of said body adapted for insertion in a threaded bore formed in



the primer pocket of said case such that stuck cases may be removed from said sizer die by boring a hole in said primer pocket, tapping said bore to form screw threads therein, removing said case holder from said ram before inserting the rim formed in the body of said extracting device in the mounting slot of said ram, rotating said body to insert said screw into the threaded bore formed in said primer pocket, and moving said ram from its first position to its second position to withdraw said case from said sizer die.

4,273,025

BELT-ADVANCE MECHANISM FOR AN AUTOMATIC GAS-LOADING BELT-FEED WEAPON, ESPECIALLY A MACHINE GUN

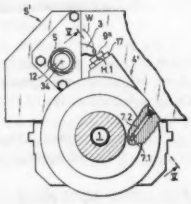
Clemens Bremer, and Lothar Post, both of Düsseldorf, Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

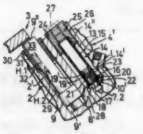
Filed Feb. 27, 1979, Ser. No. 15,649

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1978, 2809505

Int. Cl.³ F41D *10/04*

U.S. Cl. 89—33 CA **8 Claims**





1. In a belt-advance system for a belt-feed gas-loading weapon having a munitions-belt advancing mechanism including an actuator element shiftable to step the munitions belt, means for tapping a portion of propellant gas from the weapon upon the firing thereof in the form of gas energy for actuating said element, a cylinder/gas-piston unit connection to said means for transforming gas energy into mechanical energy for actuation of said element by said mechanical energy, and an

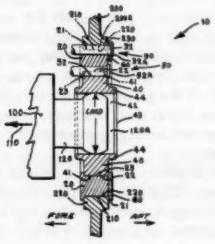
energy-storage unit capable of storing energy tapped from the weapon and forming a timer for the operation of said mechanism, the improvement wherein said units are functionally integrated and said energy-storage unit stores the gas energy directly and is provided ahead of the cylinder/gas-piston unit in the direction of energy flow for operation of said mechanism, said units being provided side-by-side in a common housing, said energy-storage unit comprising a chamber formed in said housing and having an inlet, a passage connecting said chamber with the cylinder of said cylinder/gas-piston unit, and means at said inlet for controlling the flow cross section of said inlet so that with an increasing value of the pressure p_v ahead of said inlet, the ratio $a=p_v/p_h$ reaches unity rapidly while, upon rapid fall of the value p_v, the reciprocal ratio 1/a reaches unity more slowly, p_h being the pressure downstream of said inlet.

4,273,026

GUN ALIGNMENT ADJUSTING DEVICE

Albert F. Walter, Fort Worth, Tex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 3, 1979, Ser. No. 63,499
Int. Cl.³ F41F *19/00*
U.S. Cl. 89—37 R **8 Claims**



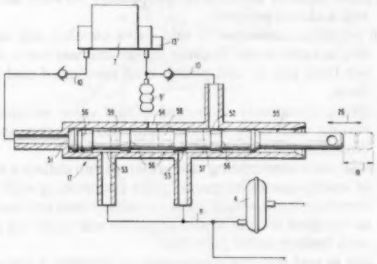
1. A gun alignment adjusting device, in combination with:
a a gun having an alignment and an aft support;
b. and, a stationary support structure adjacent to and aft of said aft support of said gun, wherein said stationary support structure has an opening therein and therethrough in alignment with, and sized larger than, said aft support of said gun and has a perimeter formed by said opening, and also has an index marking at a preselected fixed location adjacent said opening and said perimeter thereof;
wherein said gun alignment adjusting device comprises:
a. an outer eccentric member rotatably mounted in said opening in said stationary support structure, wherein said outer eccentric member has an outer perimeter with a scale along thereat divided into a plurality of a preselected number of marked equal spacings, with each one of said marked spacings rotatably and selectively setable in alignment with said index marking of said stationary support structure, and wherein said outer eccentric member has an off-center opening therein and therethrough forming an inner perimeter of said outer eccentric member, with said off-center opening being sized larger than said aft support of said gun, and wherein said outer eccentric member also has an index marking at a preselected fixed location adjacent said off-center opening and said inner perimeter thereof;
b. means for releasably locking, in a preselected rotational relationship, sad outer eccentric member to said stationary support structure;
c. an inner eccentric member rotatably mounted in such off-center opening in said outer eccentric member, wherein said inner eccentric member has an outer perimeter with a scale along thereat divided into a plurality of a preselected number of marked spacings, an off-center opening therein and therethrough into which said aft support of said gun is free-fitted and is releasably supported and held, an inner perimeter formed by said off-center opening, and a hub portion surrounding said off-center opening;
d. and, means for releasably locking, in a preselected rotational relationship, said inner eccentric member to said outer eccentric member;
whereby said inner and outer eccentric members are rotatable and releasably lockable, in a preselected rotated positional relationship, relative to each other and to said stationary support structure,
and whereby said inner and outer eccentric members are useable complementarily with, and cooperatively with, each other and with said stationary support structure, thereby permitting said alignment of said gun to be set, as desired.

4,273,027

PNEUMATIC ACTUATING ARRANGEMENT, ESPECIALLY FOR CENTRAL LOCKING SYSTEMS, AND SHIFTING VALVES THEREFOR

Theodor Reinhard, Böblingen; Ernst Haug; Rüdiger Hoffmann, both of Sindelfingen, and Dieter Feichtiger, Aidlingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Untertuerkheim, Fed. Rep. of Germany

Filed Jun. 1, 1978, Ser. No. 911,314
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1977, 2742666
Int. Cl.³ E05B *65/38*; F15B *13/04*
U.S. Cl. 91—32 **22 Claims**



1. A pneumatic actuating arrangement for a central locking system of motor vehicles, the pneumatic actuating arrangement being adapted to open and close locking means of the motor vehicle, the actuating arrangement comprising an excess pressure source means, a vacuum source means, and at least one working device, the at least one working device having a single working chamber means, a single shifting valve means for selectively connecting the single working chamber means with the excess pressure source means and vacuum source means, the shifting valve means being shiftable between two end positions, characterized in that the shifting valve means connects the working chamber means with the excess pressure source means in one end position to act in said working chamber means to move the working device in one direction and connects the working chamber means with the vacuum source means in the second end position to act in said working chamber means to move the working device in an opposite direction, the shifting valve means is shiftable into an intermediate position which becomes effective temporarily during a transition of the shifting valve means from one of the two end positions into the other of the two end positions, and in that the shifting valve means connects the working chamber means with the atmosphere solely when the shifting valve means is in the intermediate position.

4,273,028
VALVES AND OPERATING SYSTEM FOR EXPANSION MACHINES

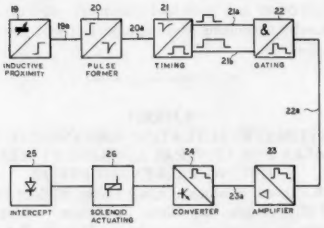
Ernst Turnwald, Altenmarkt; Stefan Asztalos, and Rudolf Rosenmeier, both of Munich, all of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Apr. 5, 1979, Ser. No. 27,390

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1978, 2815849

Int. Cl.³ F01L *25/08*

U.S. Cl. 91—275 **8 Claims**



1. A valve system for a piston-type machine having a crankshaft connected to a piston reciprocable in a cylinder, said valve system comprising:

(a) a valve comprising:

a valve housing formed with a passage communicating between a pair of gas spaces and controlling gas flow relative to said cylinder,

a valve member shiftable in said passage between an open and a closed position,

an armature connected to said valve member and axially displaceable in said housing for shifting said valve member from one of said positions to another of said positions,

a spring operatively connected to said valve member for biasing said valve member and said armature in one direction toward one of said positions,

a pole piece surrounding said armature and defining a pair of axially-spaced magnetic poles cooperating with said armature, each of said poles having a recess conforming to the cross section of said armature and receiving same with limited radial play, and

a coil in said housing energizable to generate a magnetic field through said pole piece and displace said armature relative thereto;

(b) an inductive proximity switch responsive to operation of said crankshaft for producing a timing signal for said valve; and

(c) circuit means connected between said inductive proximity switch and said coil for energizing same, said circuit means comprising:

an input pulse forming stage connected to said switch for generating a steep-flank voltage pulse upon receipt of said signal,

a timer stage connected to said input stage for producing two rectangular voltage pulses of different adjustable duration upon receipt of said steep-flank pulse,

a gating stage connected to said timer stage and responsive to said rectangular pulses for producing a stepped voltage signal having a high amplitude initial portion and a low amplitude following portion,

an amplifier stage connected to said gating stage for amplifying said stepped signal,

a power converter stage connected to said amplifier stage for energizing said coil with a current pulse of stepped amplitude conforming to the amplified stepped signal, and

an intercept stage effective upon current deenergization of the coil for draining same to enable rapid displacement of said valve member by said spring.

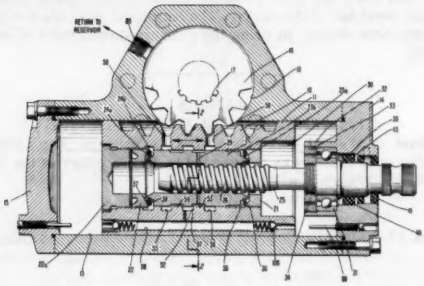
4,273,029
POWER STEERING GEAR WITH IMPROVED RESPONSIVENESS

Richard H. Sheppard, Hanover, Pa. 17331

Filed May 8, 1979, Ser. No. 37,046

Int. Cl.³ F15B *9/10*

U.S. Cl. 91—422 **10 Claims**



1. In a power steering gear having a reciprocating power piston in a cylinder, a valve within the piston having distribution grooves to selectively distribute pressurized fluid to a first and second end of the piston within the cylinder for steering action, a steering input shaft operatively engaging the valve, and an output means in engagement with said piston, the improvement comprising:

first and second washer spring assemblies mounted in opposition to each other adjacent the ends of said valve,

dual washer springs in each assembly and being substantially flat and mounted adjacent each other whereby a substantially increased spring rate is obtained to provide comparable increased responsiveness of said valve.

4,273,030
PRESSURE RELIEF VALVE FOR THE WORKING PRESSURE OF A SERVO-STEERING SYSTEM

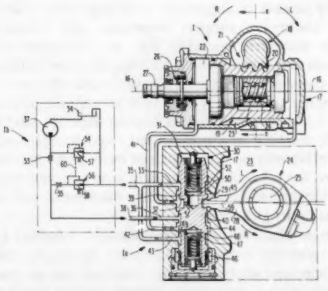
Bruno Beeskow, Bietigheim; Egon Bauer, Göppingen, and Wolfgang Pfundstein, Stuttgart, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Mar. 6, 1978, Ser. No. 883,781

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1977, 2710001

Int. Cl.³ F15B *13/14, 13/042*

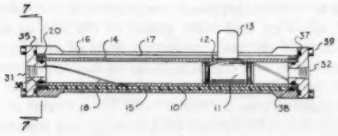
U.S. Cl. 91—450 **30 Claims**



1. A pressure-relief valve for a working pressure of a servo-

steering mechanism having a steering shaft in a vehicle, comprising a pressure-medium connection between a high pressure pump connection operable to be placed under the working pressure and a return connection operable to be placed under a lower pressure, including valve adjusting means retained under normal conditions in a normal position closing the pressure-medium connection from communication with said return connection, and control means operating in dependence upon an operating magnitude of the servo-steering mechanism and operable upon exceeding a critical value of the operating magnitude so as to displace the valve-adjusting means into a by-pass position opening up the pressure-medium connection to a return line by means of said return connection, characterized in that the operating magnitude is an external load moment and the control means is operable in dependence on said external load moment of the servo-steering mechanism, and in that the valve-adjusting means is displaced into the by-pass position as a function of the load moment on the servo-steering mechanism substantially independently of the angle of rotation of said steering shaft of said servo-steering mechanism so as to decrease the working pressure of the servo-steering mechanism as manual torque on a steering wheel operatively connected with the servo-steering mechanism increases.

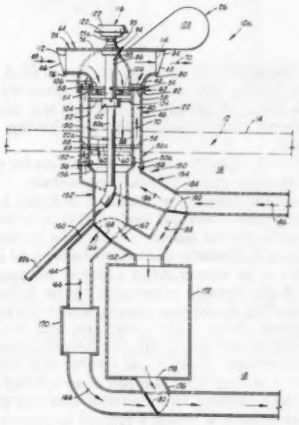
4,273,031
FLUID PRESSURE CONTAINMENT ACTUATOR
Albert H. Hannon, 805 Dorado Dr., Santa Barbara, Calif. 93111
Filed May 22, 1979, Ser. No. 41,383
Int. Cl.³ F01B *29/08*
U.S. Cl. 92—88 **4 Claims**



1. A fluid power device for converting pressurized fluid into mechanical force, comprising:
   (a) a vessel to contain a pressurized fluid, said vessel having extended through the surface thereof a longitudinal slot;
   (b) a piston positioned within said vessel to move longitudinally with respect to said vessel in response to said pressurized fluid;
   (c) a hollow tube having a spiral slot through the surface thereof, said tube positioned to rotate within said vessel to provide a continuous seal of said longitudinal slot except in one moveable contiguous area of said spiral slot and longitudinal slot; and
   (d) means passing through said moveable contiguous area of said longitudinal slot and spiral slot for attaching said moveable piston to a load exterior to said vessel, and said means for attaching including means for sealing said longitudinal slot at said moveable contiguous area.

4,273,032
VENTILATOR APPARATUS
Robert C. Spain, Box 728, Frederick, Okla. 73542
Filed Oct. 18, 1979, Ser. No. 85,940
Int. Cl.³ F24F *7/00*
U.S. Cl. 98—63 **43 Claims**

1. A ventilator apparatus for venting objectionable odors from an interior area of a structure to the atmosphere and for providing air circulation in the structure, the interior area of the structure having a first interior portion and a second interior portion, the ventilator apparatus comprising:
   a vent conduit having a first end portion, a medial portion, and a second end portion, the vent conduit being secured to the structure such that the first end portion and the medial portion of the vent conduit are substantially vertically disposed and the second end portion is disposed within the first interior portion of the structure, the first end portion of the vent conduit extending upwardly from the structure, the vent conduit establishing fluid communication between the first interior portion of the structure and the atmosphere;
   a housing having a first end portion and an opposed second end portion, the opposed end portion of the housing being disposed within the second interior portion of the structure and the first end portion of the housing extending upwardly from the structure, the housing encompassing the medial portion of the vent conduit such that the first end portion of the vent conduit extends a distance from the first end portion of the housing and the second end portion of the vent conduit extends a distance from the opposed second end portion of the housing, the housing being further characterized as having an axially disposed inner passageway and an axially disposed outer passageway therein, the inner and the outer axially disposed passageways establishing fluid communication between



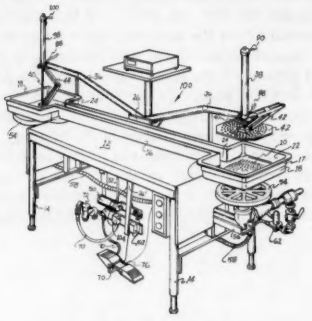
the second interior portion of the structure and the atmosphere;
   a terminal housing having an inlet and an outlet, the inlet being positioned in the terminal housing substantially opposite the outlet such that the inlet and outlet face in opposite direction, the terminal housing being rotatably mounted to the first end portion of the vent conduit and encompassing the first end portion of the housing such that in an assembled position the vent conduit communicates with the atmosphere, the inlet of the terminal housing communicating with one of the inner and the outer axially disposed passageways of the housing and the outlet of the terminal housing communicating with the other of the inner and the outer axially disposed passageways, the inlet and outlet of the terminal housing having a common central axis, the central axis being substantially perpendicular to a vertical axis of the vent conduit disposed with the housing; and
   means secured to the terminal housing for orienting the terminal housing such that the inlet of the terminal housing faces the wind.

4,273,033

METHOD AND APPARATUS FOR FLASH COOKING FOOD

Jaxon O. Hice, Clover, S.C., assignor to Research Associates, Ltd., Charlotte, N.C.

Division of Ser. No. 804,492, Jun. 8, 1977, Pat. No. 4,123,560.
This application Sep. 25, 1978, Ser. No. 945,229
Int. Cl.³ A47J *37/12*
U.S. Cl. 99—349 **5 Claims**



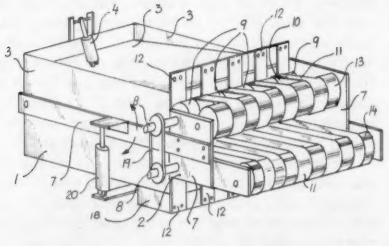
1. Apparatus for flash cooking a portion of food, comprising:
(a) a pan having side walls extending upwardly from a generally flat cooking surface on which said food portion is supported, one of said side walls having an opening therein;
(b) selectively operable compression means for pressing said food portion against said cooking surface;
(c) means for forming an interface of liquid between said cooking surface and said food portion at the time said food portion is pressed against said cooking surface;
(d) selectively operable means for causing said pressed food portion to be submerged in a heated cooking liquid, said selectively operable submerging means including a conduit leading to said side opening and mounted for pivotal movement about a horizontal axis, and said selectively operable submerging means also including conduit control means operable to move said conduit to a first position at which it extends from said pan in an upward direction to cause said cooking liquid to flow into said pan and to a second position at which it extends in a downward direction to cause said cooking liquid to flow out of said pan.

4,273,034

BALE FORMING APPARATUS

Joseph Molitorisz, 624 81st Ave. NE., Bellevue, Wash. 98004

Filed Jan. 23, 1980, Ser. No. 114,622
Int. Cl.³ B65B *13/20*
U.S. Cl. 100—8 **1 Claim**



1. A bale forming apparatus to compress loose fibrous agricultural crops or industrial products into substantially rectangular bales which are held together by twine, wire or the like, said bale forming apparatus comprising; a longitudinally extending and substantially rectangular bale forming channel assembly, and a feeder-compactor assembly, said bale forming channel assembly having a substantially rectangular intake port, and being confined by longitudinally extending lateral boundaries, at least one of said lateral boundaries being flexibly suspended and inwardly biased by suitable biasing means, said inwardly biased lateral boundaries being in frictional contact with said formed bale exerting frictional resistance against the movement of said formed bale in said bale forming channel, said bale forming apparatus having a suitable mechanism to wrap and tie said twine, wire or the like around said formed bale, said feeder-compactor assembly consisting of; a plurality of feeder-compactor rollers rotatably supported by a common frame and being held substantially parallel relative to each other and at an adjustable distance to confine a transverse intake opening between their adjacent rotational peripheral surfaces, the common frame of said feeder-compactor assembly being pivotally mounted to said bale forming channel assembly, power drive means connected to said bale forming channel assembly and said common frame for movement thereof in a reversing up and down motion, each of said feeder-compactor rollers having a longitudinally extending shaft holding a plurality of substantially cylindrical compactor disks securely fastened to said shaft to receive rotational drive, said compactor disks being separated from each other by substantially cylindrical pulleys, said pulleys being rotatably mounted on said shaft, a plurality of belts, chains or the like being partially wrapped and at one of their ends securely attached to said compactor disks of said feeder-compactor rollers, the opposite ends of said belts, chains or the like being securely attached to suitable structural components of said bale forming channel, allowing said belts, chains or the like to wrap and unwrap around the said compactor disks of said feeder-compactor rollers as said common frame of said feeder-compactor assembly being power driven causing its reversing or oscillating upward-downward motion, said belts, chains or the like being extended between said feeder-compactor rollers and said suitable structural components of said bale forming channel in such way that those belts, chains or the like being securely attached to the said compactor disks of said upper feeder-compactor roller are also being securely attached to said suitable structural component at or near the upper boundaries of said bale forming channel, said belts, chains or the like being securely attached to said compactor disks of said lower feeder-compactor roller are also being securely attached to said suitable structural component at or near said lower boundaries of said bale forming channel, said belts, chains or the like partially covering said intake port of said bale forming channel, holding the deposited layers of the bale in said bale forming channel, said common shafts of said feeder-compactor rollers being interconnected by suitable power transmission means such as drive chain or the like, to assure the simultaneous rotational motion of said feeder-compactor rollers in identical directions as said belts, chains or the like wrap and unwrap around said feeder-compactor rollers as said common frame or said feeder-compactor assembly performs its reversing or oscillating upward downward motion in a plane at or near to said intake port of said bale forming channel between or beyond said upper and lower boundaries of said intake port of said bale forming channel, said rotatably mounted pulleys of said feeder-compactor rollers being connected to suitably positioned feeder-rollers by a plurality of endless chains, belts or the like, said feeder-rollers being journally mounted on a suitable frame and receiving power drive to cause their rotation in such way that the interaction between said plurality of endless chains, belts or the like compress and convey the loose fibrous material to said intake port of said bale forming channel regardless of the direction of rotation of said feeder-compactor rollers, said feeder-compactor rollers receiving and depositing said compressed sheet of fibrous material in a plane which is confined by the lateral boundaries of said intake port of said bale forming channel, said deposition or laying of the compressed sheet of fibrous mate-

rial being accomplished in a continuous process by reversing the direction of the motion of said feeder-compactor assembly in said plane at or near said intake port of said bale forming channel at properly selected positions relative to said upper and lower boundaries of said intake port, said reversal of the direction of motion of said feeder-compactor assembly in said plane at or near said intake port of said bale forming channel causing the reversal of the laying of the compressed fibrous material, folding it at or near said upper and lower boundaries of said intake port of said bale forming channel, resulting in the buildup of the body of the bale by depositing and compressing the subsequently folded layers in said bale forming channel, said feeder-compactor rollers exerting compressive forces on said formed bale causing the compaction and sliding motion of said formed bale in said bale forming channel, said formed bale having reached its desired length being tied together by a suitable tying mechanism with twine, wire or the like, said formed and tied bale being forced out from said bale forming channel at its discharge end by the subsequently formed bales.

4,273,035

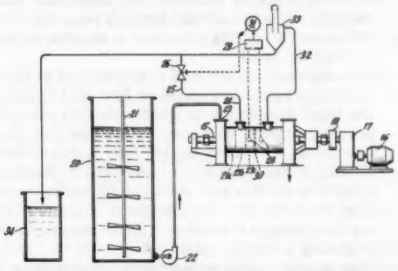
METHOD AND APPARATUS FOR STABILIZING OPERATION OF A PRESS

Dante S. Cusi, Benjamin Franklin 132, Mexico City 18, Mexico

Continuation-in-part of Ser. No. 937,755, Aug. 29, 1978, abandoned. This application Dec. 20, 1978, Ser. No. 971,307

Int. Cl.³ B30B *9/12*

U.S. Cl. 100—37 **40 Claims**



1. A method for stabilizing the operation of a press used to separate the phases of a liquid-solid mixture wherein the discharge of liquid expressed from the mixture upstream of a control position downstream from the inlet of the press is restricted by an adjustable valve comprising the steps of

(a) measuring the pressure of the liquid-solid mixture at the control position,

(b) comparing the measured value of the pressure at the control position with a predetermined optimum value of the pressure at the control position, and

(c) generating as a result of the comparison a change in the restriction caused by the adjustable valve which tends to reduce any difference between the measured value and the optimum value.

4,273,036

MACHINE FOR ROLLING CROPS INTO ROUND BALES

Arnold F. Kopaska, Guthrie Center, Iowa 50115

Continuation of Ser. No. 914,005, Jun. 9, 1978, abandoned, which is a division of Ser. No. 704,173, Jul. 12, 1976, Pat. No. 4,121,513. This application Jun. 2, 1980, Ser. No. 155,551

Int. Cl.³ B30B *5/06*

U.S. Cl. 100—88 **3 Claims**

1. In a machine having a frame and apparatus for applying compactive pressure to a cylindrical crop bale while the same is being formed within the machine, the improvement in said apparatus comprising:

a tension arm mounted on said frame for swinging movement about an axis transverse to the arm,

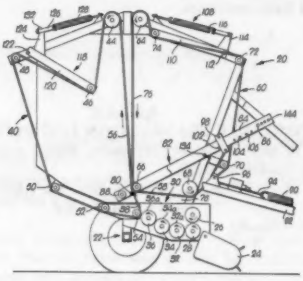
said arm being operable to transmit progressively increasing compactive pressure to the bale as the latter grows diametrically and the arm is swung from a starting end of its path of travel toward a finishing end of its path of travel corresponding to full bale size;

a spring for resisting said movement of the arm whereby to supply said compactive pressure,

said spring having an anchor point at one end thereof with said frame; and

a slip connection on the other end of said spring operably coupling the same with the arm,

said spring being so oriented with respect to said arm that shortly before the arm reaches said finishing end of its path of travel, the slip connection slips in a direction to prevent further increase in the compactive pressure applied to the bale notwithstanding continued swinging of the arm toward said finishing end of its path of travel,



said arm having a surface and a first and a second stop spaced apart along said surface,

said first stop being closer than said second stop to said anchor point of the spring when the arm is at said starting end of its path of travel, and said second stop being closer than said first stop to said anchor point of the spring when the arm is at said finishing end of its path of travel,

said surface being disposed to shift from an acute angle with the line of force from said spring to an obtuse angle with the line of force from said spring as the arm swings from the starting end of its path of travel to the finishing end of its path of travel,

said slip connection including means movable along said surface by said spring from said first stop as said surface of the arm shifts to said obtuse angle with the line of force from said spring and the arm approaches said finishing end of its path of travel.

4,273,037

COMPACTOR

George B. Ruebesam, R.R. #1, Box 12A, Readsboro, Vt. 05350

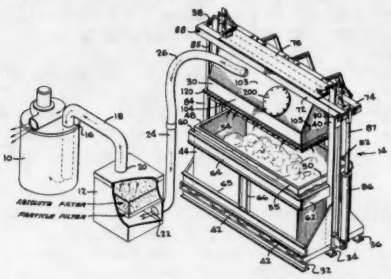
Filed Sep. 26, 1979, Ser. No. 79,170

Int. Cl.³ B30B *1/34*

U.S. Cl. 100—91 **10 Claims**

1. A trash compactor including a base frame means, a compactor piston having side wall means and an end face, piston guide means supporting piston for linear reciprocation with respect to said base frame means, a plurality of suction openings positioned about the periphery of said piston in said side wall means, a vacuum source, means connecting said vacuum source to said suction openings, an open-topped trash con-

tainer mounted on said frame means and dimensioned to matingly receive said compactor piston and power drive means for



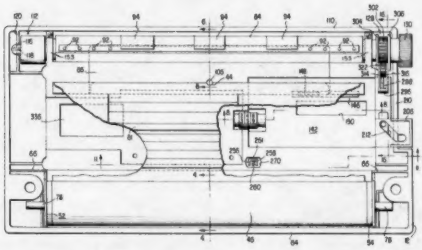
reciprocating said compactor piston into and out of said open-topped trash container.

4,273,038

PORTABLE TRANSACTION LOG RECORDER

Heinz F. Strohschneider, Plymouth, Mass., assignor to DBS, Inc., Randolph, Mass.

Filed Jan. 29, 1979, Ser. No. 7,638
Int. Cl.[3] B41F *3/04*
U.S. Cl. 101—45 **9 Claims**



1. A portable transaction log recorder for processing at least one transaction log sheet comprising

a base,

means supported by said base for removably receiving a printing plate;

supply means disposed on one side of said printing plate receiving means supported by said base for removably storing said transaction log sheet;

take-up means disposed on the other side of said printing plate receiving means supported by said base for removing said transaction log sheet from said supply means across said printing plate receiving means; and

means for braking said take-up means to thereby maintain said log sheet in a predetermined spatial relationship with respect to said printing plate receiving means, said brake means including

a first gear connected to said take-up means;

second and third gears normally in engagement with said first gear and with each other; and

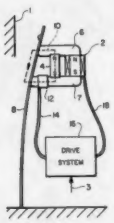
means for disengaging at least said third gear from said first gear to disengage the brake means and permit said take-up means to remove the log sheet from the supply means, said brake means being engaged when said third gear engages said first gear.

4,273,039

IMPACT PRINTING APPARATUS AND METHOD USING RELUCTANCE SWITCHING AND A CLOSED LOOP DRIVE SYSTEM

Zong S. Luo, and Todd M. Woodcock, both of Boise, Id., assignors to Hewlett Packard Company, Palo Alto, Calif.

Filed Aug. 3, 1979, Ser. No. 63,502
Int. Cl.[3] B41J *9/42, 3/12*
U.S. Cl. 101—93.02 **3 Claims**



1. Printing apparatus comprising:

a first pole piece;

a second pole piece;

magnetic field means magnetically coupled to the first pole piece and the second pole piece for producing a first magnetic field;

reluctance switching means having reluctance and being magnetically coupled to the first pole piece and the second pole piece for varying reluctance in response to receiving a switching signal;

a ferromagnetic tine disposed to be attracted to the second pole piece by the first magnetic field, said ferromagnetic tine being magnetically coupled to the first pole piece and being structurally connected to the first pole piece and structurally distortable by the first magnetic field; said reluctance switching means comprising an electromagnet coupled to the first pole piece and the second pole piece;

sensing means for detecting changes in magnetic flux resulting from changes in position of the ferromagnetic tine and producing a sensing signal; and

driving means coupled to receive the sensing signal and an applied firing signal for first applying a signal of a first polarity to the electromagnet in response to the firing signal and then applying a signal of a second polarity to the electromagnet in response to the sensing signal.

4,273,040

SEGMENTED DRUM BAR HELIX PRINTER

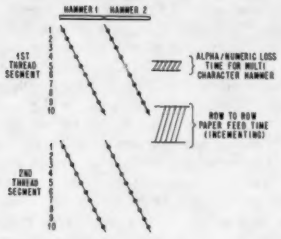
Robert A. Sebrosky, Newtown, Pa., and William D. Thorne, Wake Forest, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 28, 1979, Ser. No. 79,761
Int. Cl.[3] B41J *3/08*
U.S. Cl. 101—93.04 **7 Claims**

1. In a mosaic printer having a cylindrical rotating drum, rotating at some arbitrary fixed rate, the outer surface of which has at least one raised spiral thread, and having at least one print hammer located adjacent to said drum and being provided with means for firing said hammer to impact against said spiral thread at desired times, and a printing medium interposed between said hammer and said thread and means associated with said printing medium for moving said medium at some arbitrary feed rate between said hammer and said drum to effect printing operations in either incremental or fixed speed modes, and timing means for controlling the times during the revolution of said drum that said hammer is moved to impact said medium against a portion of said spiral thread, the improvements comprising:

said spiral thread being divided into a plurality of segments; and

the endings and beginnings, respectively, of each of said segments relative to the preceding and succeeding segments thereof being offset from one another circumferentially on said drum by a distance at least equal to that


HAMMER 1
HAMMER 2
1ST THREAD SEGMENT
ALPHA/NUMERIC LOSS TIME FOR MULTI CHARACTER HAMMER
ROW TO ROW PAPER FEED TIME (INCREMENTING)
2ND THREAD SEGMENT

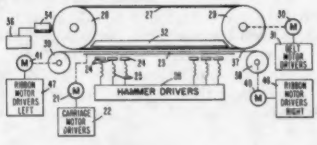
distance traversed by any point on the periphery of said drum at said rate of revolution thereof during the time required by said moving means to move said print medium at said rate to a new printing position.

4,273,041

BELT PRINTER CONTROL ARCHITECTURE

Richard D. Bolcavage, Kirkwood; Armand J. Ferraro, Endicott, both of N.Y., and Arthur E. Fleek, Cary, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 28, 1980, Ser. No. 115,856
Int. Cl.³ B41J *1/20*
U.S. Cl. 101—93.14 **33 Claims**



1. A printer system interconnectable to a host system for receipt of control and printing information for printing lines of data comprising in combination,

a printer mechanism having a revolving type belt with an array of type elements repeatedly alignable in scan/subscan sequences with a row of print hammers,

said printer mechanism also including a forms feed mechanism and a drive for an ink ribbon cooperable with said type belt and print hammers to print characters on forms in said printer mechanism and to perform other operations ancillary to printing,

control means for said printer mechanism including

a plurality of control elements related to printing operations and non-printing operations of said printer mechanism,

a first microprocessor operable for receiving control and printing information from said host system and for controlling certain control elements related to non-printing operations of said printer mechanism,

a first bus interconnecting said first microprocessor with said host system for receiving said control and printing information and with said certain control elements related to said nonprinting operations of said printer mechanism,

a second microprocessor for controlling printing operations of said printer mechanism,

a second bus interconnecting said second microprocessor with certain of said control elements related to printing operations of said printer mechanism,

RAM storage means for storing printing information for plural lines of data along with control information relating to printing operations and nonprinting operations,

a common bus for interconnecting said first and second microprocessors to said RAM storage means,

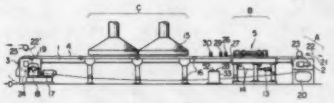
said common bus being accessible by said first and second microprocessors in alternate phases to said RAM storage for storing, processing, and retrieving information to be printed and control information to be used by said first and second microprocessors to perform said printing and nonprinting operations by said printer mechanism.

4,273,042

AUTOMATIC SCREEN PRINTING PROCESS AND APPARATUS

Saneto Machida, Nishinomiya, Japan, assignor to Toshin Kogyo Co., Ltd., Hyogo, Japan

Filed Nov. 17, 1978, Ser. No. 961,641
Claims priority, application Japan, Nov. 26, 1977, 52-141119; Oct. 7, 1978, 53-124049
Int. Cl.³ B05C *17/04*; B41L *27/00*
U.S. Cl. 101—123 **2 Claims**



1. An automatic screen printing apparatus which comprises:

an endless belt laid out to travel through a pasting operation zone, a printing operation zone, a drying operation zone and a washing operation zone by means of a pair of pulleys,

a servo drive mechanism for driving one of said pair of pulleys to thereby drive said endless belt intermittently and continuously around said pair of pulleys,

a pasting mechanism disposed in the pasting operation zone so that it can engage with and separate from the endless belt,

a mechanism for feeding to the endless belt a material to be printed and having a printing-starting end and applying and sticking the material to the endless belt.

a printing unit disposed in said printing operation zone, said printing unit including a flat screen having a standard end, a squeegee capable of scanning on the screen and a squeegee driving mechanism, said printing unit further comprising a mechanism for printing marks for respective feedings on the surface of the endless belt prior to or simultaneously with printing of a first color,

a mark detecting mechanism disposed in the printing operation zone for detecting said feeding marks,

a first control mechanism for stopping said servo drive mechanism in response to a signal issued from said mark detecting mechanism to control a repeat length of the endless belt,

a lift mechanism for driving and moving the printing unit in a vertical direction between a lowermost printing position and an uppermost non-printing position,

a drying device disposed in said drying operation zone,

a mechanism for peeling off a printed product from the endless belt,

a washing mechanism disposed in the washing operation zone so that it can engage with and separate from the endless belt,

a positioning mechanism for correctly registering the printing-starting end of the material to be printed with the standard end of the screen of the printing unit, and

a drive control mechanism for continuously driving said servo drive mechanism for applying the whole length of the material to be printed onto the endless belt along a predetermined length prior to printing and, after the application of the material to be printed has been completed, intermittently driving said servo drive mechanism for

travelling the endless belt intermittently by a predetermined repeat length along the entire surface of the material to be printed,

wherein said mark detecting mechanism comprises a first detecting device to issue signals to said first control mechanism for reducing the speed of the endless belt during periods of intermittent travel thereof, and a second detecting device to issue signals to said first control mechanism for stopping the intermittent travel of the endless belt,

wherein said first detecting device is located downstream of said second detecting device in the direction of travel of the endless belt,

wherein said pasting mechanism and washing mechanism are connected to said drive control mechanism so that the pasting and washing mechanisms operate on the endless belt only when the endless belt is continuously driven, and

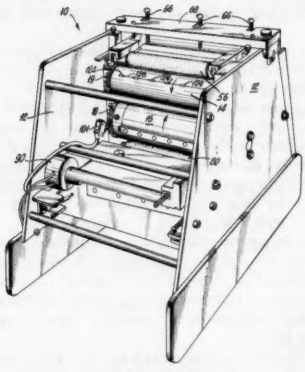
wherein said lift mechanism and squeegee driving mechanism are connected to said drive control mechanism so that dropping of the printing unit to the lowermost position is performed on confirmation of the repeat length feeding of the material to be printed, scanning movement of the squeegee is performed on confirmation of completion of dropping of the printing unit to the lowermost position elevation of the printing unit to the uppermost position is performed on confirmation of completion of scanning movement of the squeegee and driving of the endless belt is performed on confirmation of elevation of the printing unit to the uppermost position.

4,273,043

LABEL MAKING APPARATUS

Peter V. Martino, 99-60 65th Rd., Rego Park, N.Y. 11374

Filed Oct. 15, 1979, Ser. No. 84,671
Int. Cl.³ B41F *9/00*
U.S. Cl. 101—143 **15 Claims**



1. An apparatus for reproducing the indicia of a master sheet on a continuous web for printing labels comprising:

a rotatable plate roller, said plate roller having a means for attaching said master sheet thereto;

a fountain solution module for supplying a fountain solution to the master sheet on said plate roller;

an ink module positioned for supplying ink to said master sheet on said plate roller after said master sheet has been supplied with fountain solution;

a rotatable blanket roller having a diameter equal to the diameter of said plate roller, said blanket roller being in contact with said plate roller;

drive means connected to both said plate roller and said blanket roller, with said rollers being rotated at the same speed such that the ink placed on said plate roller is accurately transferred to said blanket roller;

a rotatable impression roller mounted for reciprocating movement into and out of contact with said blanket roller;

means for selectively moving said impression roller into or out of contact with said blanket roller; and

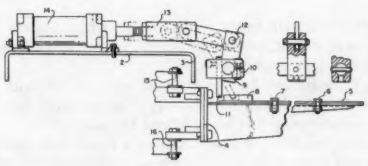
control means for actuating said moving means whereby when said impression roller is brought into contact with said blanket roller, said blanket roller will cause said impression roller to rotate such that when said continuous web is fed adjacent to the nip between said blanket and impression rollers, it will be drawn therethrough, thereby transferring the ink on said blanket roller to said continuous web, said control means for activating said moving means including first and second micro-switches disposed adjacent the rotational axis of one of said plate and blanket rollers, and wherein said first micro-switch functions to activate said moving means which places said impression roller in contact with said blanket roller, and wherein said second micro-switch functions thereafter to deactivate said moving means thereby lowering said impression roller out of contact with said blanket roller, said control means further including means provided to vary the time lag between the activation of said first micro-switch and the activation of said second micro-switch such that the length of time said impression roller is in contact with said blanket roller may be varied for enabling the length of the printing on the continuous web to be adjusted, with said means for varying the time lag between the activation of said first micro-switch and the activation of said second micro-switch including a means for varying the position of one of said switches relative to the rotational axis of the associated roller.

4,273,044

SERIGRAPHIC PRINTING MACHINE PRINTING A NUMBER OF OBJECTS IN SEVERAL COLORS

Umberto Brasa, Via Ippolito Nievo, No. 8, Milan, Italy

Filed Jan. 24, 1980, Ser. No. 115,064
Claims priority, application Italy, Mar. 12, 1979, 20895 A/79
Int. Cl.³ B41F *1/12, 1/34, 17/38*
U.S. Cl. 101—193 **6 Claims**



1. A serigraphic printing machine for printing several colors on objects, each object being carried on a bracket and each bracket being moved through several printing stations spaced from each other along a generally straight length of the machine, at each station a color being printed by a planar panel on each object in registration with the colors printed at the other stations, the machine comprising:

means for alignment of the object with the printing panel at each printing station to assure proper registration of the colors printed at the several stations, said means comprising:

a generally planar support connected to each bracket by a pivot pin around which the support is rotatable in its plane, the support arranged to be generally parallel with the planar panel when the panel is printing on the object and each support bearing the object on the bracket;

a centering plate fixed on each support and having a slot extending thereinto in alignment with an axis of the support passing through the pivot pin;

a rod extending and generally parallel to the straight length of the machine adjacent the printing stations and being rotatable around its longitudinal axis;

a centering pin at each printing station registerably fixed along the length of said rod, in a first rotational position of said rod said pins being engaged in said slots of said centering plates to align said supports with said centering pins and said objects with said panels, and in a second rotational position of said rod said pins being disengaged from said slots to allow said brackets to be moved through said printing stations; and

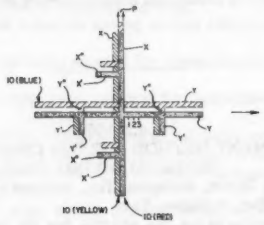
actuating means for rotating said rod to said first and second rotational positions.

4,273,045

PRINTING MACHINE REGISTRATION TARGET

Bucky Crowley, Newton, Mass., assignor to Butler Greenwich Inc., Greenwich, Conn.

Filed Jul. 23, 1979, Ser. No. 59,515
Int. Cl.³ B41F *5/06*
U.S. Cl. 101—211 **2 Claims**



1. In a method of indicating registration of printing on a web in a rotary multicolor printing press wherein a plurality of colors are printed successively on a web by a plurality of cylinders, the steps comprising printing on a selvage of the web in said plurality of colors with said plurality of cylinders indicium for registration with one another, each indicium having a pair of arms which intersect intermediate their ends at right angles so as to form a cross, one of said arms extending in a direction parallel to the direction of web travel through the press, the other of said arms extending transversely thereto, at least one tab extending out from each arm in one direction parallel to the other arm, said tab having no counterpart extending out from each arm in the opposite direction so that each said indicium is rectilinear yet asymmetric about the long axes of said arms, the widths of the arms and tabs of each indicium being substantially equal to the stroke width of the lines printed by each print cylinder on the web between its selvages, the lengths of each indicium arm and tab being integral multiples of said stroke width, and the distance between each indicium tab and the intersection of said indicium arms being an integral multiple of said stroke width thereby to indicate registration within the allowable tolerance when the corresponding arms and tabs of all of the indicia overlap one another to some extent and beyond the allowable tolerance when the corresponding arms and tabs of at least two of the indicia do not overlap, the direction of the unacceptable registration error being readily apparent from the orientation of the tabs and the amount of said error being evident by the number of stroke width segments visable between the corresponding arms and tabs of the out-of-registration indicia.

4,273,046

ATTACHING MECHANISM FOR INKING DEVICE OF PORTABLE LABEL PRINTING MACHINE OR THE LIKE

Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Japan

Filed Jun. 18, 1979, Ser. No. 49,121
Int. Cl.³ B41K *1/42, 3/60*
U.S. Cl. 101—348 **4 Claims**

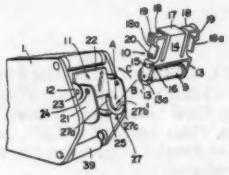
1. An attaching mechanism for attaching an inking device to a label printing machine, or the like, said attaching mechanism comprising:

a supporting device which is attached to the machine body of a label printing machine;

an ink applicator; said ink applicator comprising an inking roller supporting frame having journals thereon, and an inking roller being supported to said frame on said journals;

said ink applicator also comprising a holder which includes attaching means for fixedly attaching said holder to said supporting device;

a generally J-shaped stopper on said supporting device; said J-shaped stopper being comprised of a guide section which is one leg of the J shape, said guide section being further into said supporting device so that as said ink applicator is applied to said supporting device, its said supporting frame first engages said guide section for guiding said ink applicator supporting frame to a stopper section; a stopper section being the web of the J shape, being placed for having said ink applicator supporting frame guided to it by said guide section and being shaped



for halting further motion of said ink applicator as it is being applied to said supporting device; a retaining section being the other leg of the J shape, being less far into said supporting device than said guide section, and being for retaining said supporting frame in said stopper section said guide section of said generally J-shaped stopper being taller than said retaining section thereof;

said supporting frame having an end surface thereof near to said journals and which is curved in shape complementary to the curve of said stopper section; said supporting frame end surface being so shaped that with said frame on said stopper section, said supporting frame is swivelable between a position where it is nearer to said guide section and a position where it is further from said guide section; and

said attaching means being positioned for attaching said holder to said supporting device following application of said ink applicator to said supporting device and following rotating of said ink applicator at said stopper section of said stopper of said supporting device toward said guide section of said stopper.

4,273,047

APPARATUS FOR PERFORATING A WELL AND ITS METHOD OF ASSEMBLY

T. James Rommer, Arlington, Tex., assignor to Jet Research Center, Inc., Arlington, Tex.

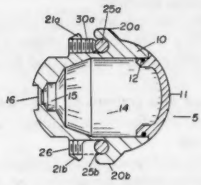
Filed Dec. 11, 1978, Ser. No. 968,537
Int. Cl.³ E21B *7/00;* **F42B** *3/08*
U.S. Cl. 102—310 **9 Claims**

9. An explosive charge unit comprising:

a case having a cavity therein adapted to receive said explosive charge; and

selectively engageable wire gripping means extending from said case, said selectively engageable wire gripping means

further comprising an ear defining a recess; a lug adjacent to said ear, said lug having a threaded aperture there-



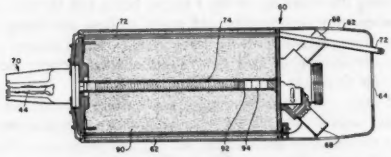
through oriented toward said recess; and a screw threaded into said aperture.

4,273,048

SURFACE-LAUNCHED FUEL-AIR EXPLOSIVE MINEFIELD CLEARANCE ROUND

Michael H. Aley, China Lake; James A. Bowen, Inyokern, and Cecil A. Glass, China Lake, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 26, 1979, Ser. No. 24,132
Int. Cl.³ F42B *3/00*
U.S. Cl. 102—363 **13 Claims**



1. A fuel-air explosive minefield clearance round for triggering mines in a target area comprising:

a rocket motor for propelling said round to the target area from a predetermined location;

a fin assembly connected to the rear of said rocket motor for stabilizing said round in flight, such that said round follows a predetermined path to the target area;

a parachute contained within said fin assembly for slowing said round prior to termination of said round's arrival at said target area;

a warhead connected to said rocket motor for containing said fuel-air explosive during travel of said round to said target area;

a burster charge container within said warhead for dispersing said fuel air explosive over said target area;

a detonator assembly contained within said warhead for detonating said dispersed fuel, such that said detonator assembly is independent of ambient temperature of said fuel;

a fuze operatively connected to said burster charge, detonator assembly and parachute; and

an extension probe of predetermined length connected to said fuze for sensing when said warhead is a predetermined distance above the ground, said probe extending afte the slowing of said round by said parachute to avoid damage to the probe due to wind shear.

4,273,049

METHOD OF BLASTING A FIELD WITH ANFO AND TL-136

Donald W. Edwards, Provo, Utah; Paul R. Young, and Thomas M. Zukovich, both of Palatine, Ill., assignors to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Oct. 22, 1979, Ser. No. 86,913
Int. Cl.³ F42D *3/00*
U.S. Cl. 102—312 **4 Claims**

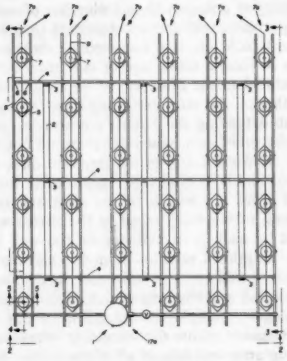
1. A method of blasting a field comprising the steps of (a) forming a drill pattern of bore holes, (b) successively delivering to each hole blasting agent TL-136 and a bulk blasting agent mixture consisting essentially of ammonium nitrate 86–90 parts by weight and 10–14 parts by weight of a hydrocarbon and a nitroalkane of 1–3 carbon atoms in a ratio of about 1:1:4 respectively and having a minimum density of 1.0 g/cc, the ammonium nitrate consisting of about a 1:1 mixture of explosive grade prills and comminuted prills, (c) adding a booster and/or primer and initiating device and (d) detonating same.

4,273,050

PLACEMENT METHOD FOR Q.D. CHARGES USING MINIMUM DIVING TIME

Claude H. Brown, Arlington, Tex., assignor to Jet Research Center, Inc., Arlington, Tex.

Continuation of Ser. No. 653,985, Jan. 30, 1976, Pat. No. 4,018,163, which is a division of Ser. No. 522,542, Nov. 11, 1974, Pat. No. 3,972,285. This application Jan. 6, 1977, Ser. No. 757,172
Int. Cl.³ F42B *3/02*
U.S. Cl. 102—321 **9 Claims**



1. A reusable framework for the remote, simultaneous placing of a plurality of explosive charges at predetermined space intervals, comprising:

(a) open frame means of sufficient strength to support a plurality of individual, separate explosive charges laterally spaced from each other and suspended therefrom;

(b) means for suspending said open frame means in a generally horizontal position from at least one overhead haul rope;

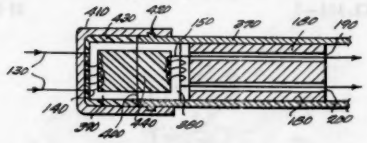
(c) releasable holding means depending downwardly from said open frame means at predetermined spacing for individually holding each one of a plurality of explosive charges; and

(d) release means interconnected with said releasable holding means for simultaneously releasing all of the explosive charges in their predetermined position.

4,273,051
ELECTRIC DEVICE

Andrew Stratton, Farnborough, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jan. 17, 1979, Ser. No. 4,265
Int. Cl.³ F42C *11/00*; F23Q *7/00*
U.S. Cl. 102—202.2 **44 Claims**



1. An electrical control circuit for selectively energizing an electrically ignited load only in response to input electrical energy from an a.c. source having predetermined electrical parameters, said control circuit comprising:

first and second inductors having mutual linkage therebetween,

said first inductor being adapted for connection to said a.c. source,

said second inductor being adapted for connection to said load,

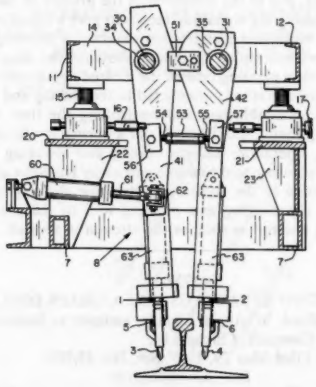
at least one of said first and second inductors being constructed and connected in circuit to provide a substantial protective inductance effectively connected in series with said load, and

an energy dissipation means, effectively coupled to said at least one inductor, for dissipating input electrical energy as a function of the voltage across and/or current through at least one of said first and second inductors.

4,273,052
SPIKE DRIVING APPARATUS

John H. Woolner, Pittsburgh; Emeric Gaslevic, Glenshaw, and Richard B. Doorley, Pittsburgh, all of Pa., assignors to Portec, Inc., Pittsburgh, Pa.

Filed Mar. 24, 1978, Ser. No. 889,845
Int. Cl.³ E01B *29/26*
U.S. Cl. 104—17 R **20 Claims**

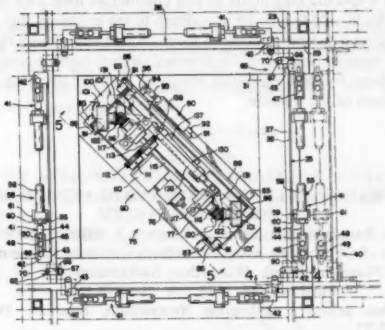


1. Spike driving apparatus including a frame adapted to be mounted on a vehicle, at least two adjustment means supported on said frame, an elongated support member depending from each of said adjustment means, means for independently moving each of said adjustment means and the corresponding depending elongated support member in a first direction, means for rotating said depending elongated support members about the upper ends to move the lower ends relative to each other in a second direction substantially perpendicular to the first direction, means operatively connecting said adjustment means for unisonant movement of said adjustment means and said depending elongated support members in said first direction, means for unisonously moving the lower ends of said depending elongated support members in said first direction and angularly in said second direction, each of said depending elongated support members supporting a ram and hydraulic cylinder and spike holding means, said spike holding means located at the lower end of said depending elongated support member and adapted to hold a spike in a position to be driven by downward movement of said ram, and means to lower said ram to drive a spike.

4,273,053
MATERIAL HANDLING APPARATUS

James W. Gibbs, Hialeah, Fla., assignor to Gibbs-Ryder Materials Handling Systems, Inc., Coral Gables, Fla.

Filed Mar. 29, 1976, Ser. No. 671,729
Int. Cl.³ B61B *13/12*
U.S. Cl. 104—168 **12 Claims**



1. Transporter apparatus for the controlled movement of goods comprising, two intersecting rail means, pallet means capable of supporting the goods, first wheel means mounted on said pallet means for engaging one of said intersecting rail means, second wheel means mounted on said pallet means for engaging the other of said intersecting rail means, and directional interchange means in each of said intersecting rail means contacting said first and second wheel means to permit movement of said pallet means in two angular directions therefrom, and drive means engaging said pallet means for selectively propelling said pallet means in either of the two angular directions, said drive means including two drive wheels which engage said pallet means disposed generally diagonally of said pallet means when positioned on said direction interchange means.

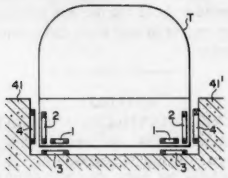
4,273,054
VEHICLE VIBRATION DAMPING METHOD IN THE INDUCED REPULSION TYPE MAGNETICALLY SUSPENDED RAILWAY VEHICLE

Hiroshi Yamashita, Yokohama; Takehiko Iwahana, Hachioji, and Shunsuke Fujiwara, Musashino, all of Japan, assignors to Japanese National Railways, Tokyo, Japan

Filed Dec. 29, 1977, Ser. No. 865,724
Claims priority, application Japan, Jan. 18, 1977, 52-3587; Jan. 18, 1977, 52-3588; Jan. 18, 1977, 52-3589
Int. Cl.³ B61B *3/00*
U.S. Cl. 104—281 **10 Claims**

1. Vehicle vibration damping means for an induced repulsion type magnetic levitation system for railway vehicles, said system having superconductive levitating magnets with alternate opposite polarity positioned at specific intervals longitudi-

nally of the vehicle and conductive loop coils or conductive sheets on the track at specific intervals in the direction of travel of the vehicle, and the vehicle is levitated by the repulsion taking place due to said superconductive magnets and the eddy currents produced by the voltage induced in said loop coils by the flux from said magnets when the vehicle runs at a specified speed, said vibration damping means comprising means on the



vehicle for constantly applying a magnetic flux in one direction and of a specific magnitude to said conductive loop coils from the vehicle, said flux being in addition to the levitation flux, for producing a damping magnetic force on said vehicle as a result of the current induced in the conductive loop coils or conductive sheets by said additional magnetic flux for damping the vibrations of the vehicle.

4,273,055

RAILWAY VEHICLE TRACTION AND BRAKING FORCE TRANSMITTING SYSTEM

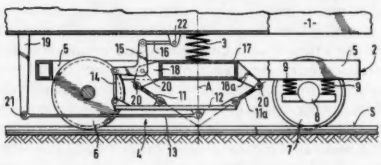
Gaston Borgeaud, Winterthur, and Johann K. Pfister, Dietlikon, both of Switzerland, assignors to Schweizerische Lokomotiv- und Maschinenfabrik, Winterthur, Switzerland

Filed Sep. 18, 1978, Ser. No. 943,306

Claims priority, application Switzerland, Sep. 20, 1977, 011452/77

Int. Cl.³ B61F *3/04, 5/16, 5/22, 5/50*

U.S. Cl. 105—199 F **15 Claims**



1. A rail vehicle comprising:

a vehicle body;

an undercarriage for supporting said body on a rail surface, and

means for transmitting traction and braking forces between said body and said undercarriage, said means including at least one bar-like connecting rod movably connected to one of said body and said undercarriage and disposed longitudinally of said body, a movable intermediate member pivotably connected to said other of said body and said undercarriage about at least one substantially transverse axis and connected to said connecting rod, at least one tie rod inclined downwardly toward the center of said undercarriage, said the rod being pivotally connected between and to said intermediate member and said other of said body and said undercarriage and means for guiding said intermediate member in a vertical plane relative to said body to maintain the position of said intermediate member relative to said undercarriage.

4,273,056

DIGGING AND PLANTING MACHINE

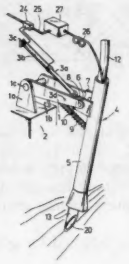
Stig-Gunnar Löfgren, Järved, and Bo G. Ekeborg, Bonässund, both of Sweden, assignors to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden

Filed May 18, 1979, Ser. No. 40,355

Claims priority, application Sweden, May 22, 1978, 7805797

Int. Cl.³ A01C *11/00*

U.S. Cl. 111—2 **21 Claims**



1. A digging and planting machine having a tubular digging and planting tool; at least one sensing and signalling means for sensing a resistance below and/or exceeding a predetermined value to penetration of the ground by the digging tip of the tool, thus gauging the condition of the ground, and detecting obstacles to such penetration so as to ensure that the digging tip provides and a plant is fed to a planting hole of the desired depth, and a digging attempt is aborted if this be impossible, and comprising an elongated member movable towards and away from the ground in a selected location where a planting hole is to be dug; means biasing the elongated member resiliently towards the ground with a force opposed by the force resisting penetration of the member into the ground, the biasing force being insufficient to prevent movement of the member against the biasing force at a resisting force above a predetermined minimum; at least one signalling means and at least one signal actuating means operatively associated with the elongated member and responding to a predetermined movement of the elongated member as a function of the penetrability of the ground, due to the condition of the ground at that location, by actuating the signalling means to give a signal indicating that the elongated member has detected a resisting force above the predetermined minimum showing the digging tip cannot provide a planting hole of the desired depth; and timing control means operatively connected to the sensing and signalling means and establishing and controlling the time for the digging and planting tool to carry out a normal cyclic digging and planting operation; and the raising and lowering of the digging and planting tool towards and away from the ground, and, in response to the signal, aborting that digging attempt and causing the digging and planting tool to make another hole-digging attempt as soon as the attempt is aborted.

4,273,057

PLANTING APPARATUS FOR A GRAIN DRILL

Lorne R. Pollard, St. Ann's, Canada, assignor to International Harvester Company, Chicago, Ill.

Filed May 29, 1979, Ser. No. 42,752

Int. Cl.³ A01C *5/06*

U.S. Cl. 111—85 **8 Claims**

1. A planting apparatus for a drawn grain drill comprising:

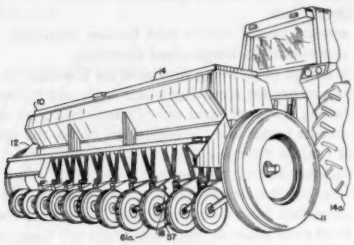
a. a drawbar adapted to be attached at a forward end to a drawbar shaft of a grain drill for pivotal movement therewith;

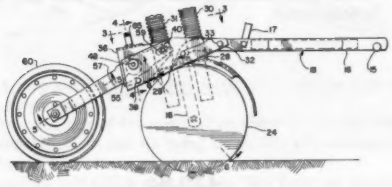
b. a pair of opposed, furrow forming disks rotatably mounted on said drawbar;

c. means adapted to be connected to the drill and connected to said drawbar for forcing said disks into the soil;

d. a seed tube located between said disks and extending toward the furrow for depositing seed therein, said tube being adapted to be connected to a seed dispenser; and

e. a press gauge wheel assembly mounted on said drawbar rearward of said disks for closing the furrow and compacting the soil on the seed, said assembly comprising:





a bracket mounted on said drawbar, an arm pivotally supported on said bracket, a wheel rotatably mounted on said arm, and a rearwardly facing adjustment means mounted on said bracket having a rotatable handle portion and a gear set for transferring said rotation to a generally vertical plane to said arm to control wheel position and hence furrow depth in response to force applied to said drawbar.

4,273,058

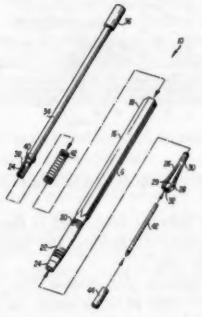
EMBROIDERY NEEDLE ASSEMBLY

Daniel Martushev, 14874 SE. Taylor Ct., Portland, Oreg. 97233

Filed Mar. 1, 1979, Ser. No. 16,370

Int. Cl.³ D05C *15/06*

U.S. Cl. 112—80 **1 Claim**



1. An embroidery needle comprising in combination a handle assembly and a needle assembly, said needle assembly including a hollow needle, said handle assembly including a hollow gripping member, said gripping member having a reducing taper at one end and a plurality of spaced annular peripheral grooves on the taper portion, at least one gauge boot slidingly received over said needle, a hollow push rod disposed within said gripping member and moveable between a first and a second position, said push rod having a swag on its outer surface adjacent one end and an open passage therethrough internally threaded at said one end, helical spring biasing means seated within the reduced taper portion of said gripping member having one end seated in said taper portion and its other end seated against said swag provided on said push rod, said one end of said push rod being disposed within said spring, said helical spring biasing means cooperating with said push rod to exert a biasing force thereon such that one end of said push rod extends outwardly from said gripping member, said push rod also having a hollow push button at its other end for the passage of thread therethrough, clasping means carried at the opposite end of said push rod for clutching said needle assembly, said clasping means having a hollow cylindrical shaft portion including external threads at one end, said clasping means being threaded to said push rod, and said clasping means including a plurality of spring finger gripping elements extending from the other end of said shaft portion and having an expanded position when said push rod is in its first position to allow free insertion between said finger elements of one end of the needle assembly and a closed position when said push rod is in its second position such that said finger elements close tightly about said one end of the needle assembly and a coaxial longitudinally passage extending through said handle assembly and needle assembly.

4,273,059

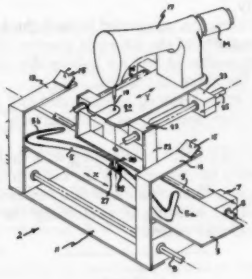
X-Y ALTERNATING DRIVE PROFILING SYSTEM

Nabil Kamal, 8166 St. Denis, Montreal, Quebec, Canada (H2P 2G6)

Filed Apr. 7, 1980, Ser. No. 137,624

Int. Cl.³ D05B *3/00, 21/00*

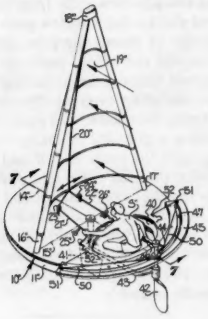
U.S. Cl. 112—121.14 **8 Claims**



1. A profiling system comprising a profile member having a profile guide element, said profile member being secured to a first displaceable frame which is displaceable along a first straight axis, a working head fixedly secured relative to a work support surface and spaced relative to said profile member, said working head and support surface being mounted on a head support frame displaceable along a second straight axis extending transversely to said first axis, support means secured relative to said profile member and displaceable therewith to retain and displace a material to be worked on by said head, a follower element fixedly secured to said head support frame and displaceably engaged with said profile guide element, said head support frame being displaced along said second axis in response to angular deviations from said first straight axis as defined by a path delineated by said profile guide element as said profile member is drivingly displaced along said first axis, said profile member being displaced along said first axis in response to angular deviation from said second axis as defined by said path as said head support frame is drivingly displaced along said second axis, and drive means selectively engaged to

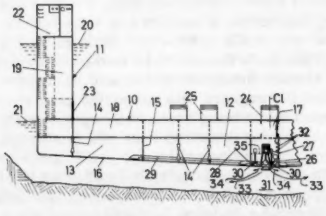
said first displaceable frame and said head support frame to selectively displace said frames along their respective straight axis.

4,273,060
SAILING VESSEL
Ivan Pavincic, P.O. Box 4005, Florence, S.C. 29501
Filed Mar. 26, 1980, Ser. No. 134,087
Int. Cl.³ B63H *9/06*
U.S. Cl. 114—39 **13 Claims**



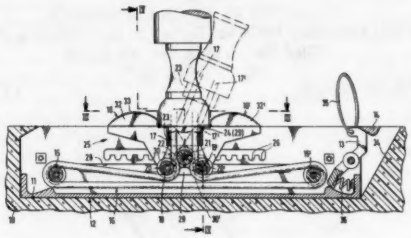
1. A sailing vessel comprising the combination of:
(a) omnidirectional hull means,
(b) a sail,
(c) sail support means carried by said hull means and extending upwardly therefrom and cooperating with said sail for supporting two side edges thereof along intersecting angularly upwardly extending axes while leaving a third side edge of said sail unsupported and extending generally horizontally,
(d) sail control means connected to said third side edge of said sail medially of the adjacent corners of the sail and cooperating with said hull for pulling the sail laterally so as to alter the shape of the sail,
(e) a centerboard positioned beneath said hull and mounted for pivotal movement about a substantially vertical axis, and
(f) a centerboard control cooperating with said centerboard and positioned for operation by the sailor of said vessel for adjusting the pivotal position of said centerboard relative to said hull for assisting in controlling the direction of movement of said vessel.

4,273,061
FLOATING DOCK
Thorsten Lundberg, Askim, Sweden, assignor to Gotaverken Arendal AB, Gothenburg, Sweden
Filed May 25, 1978, Ser. No. 909,681
Int. Cl.³ B63B *1/06*
U.S. Cl. 114—45 **2 Claims**



1. A floating dock comprising a ship supporting bottom structure enclosing a plurality of ballast tanks disposed on either side of the longitudinal center line of said dock, and two longitudinal side walls extending upwards from said bottom structure,
a bottom plating, downwardly defining said bottom structure and being downwardly inclined from the longitudinal sides of the bottom structure towards its longitudinal center line,
a service tunnel within said bottom structure, extending centrally in its longitudinal direction,
said ballast tanks being floodable for lowering the dock,
pump means for removing water from said ballast tanks for raising the dock, said pump means being located in said service tunnel and having outlets below the same,
said outlets directing flow of water outwardly along the inclined bottom plating, and
at least one watertight staircase within one of said side walls extending from a portion thereof remaining above water level even when the dock is brought to a lowered position, and into said bottom structure, as well as a transverse tunnel communicating said staircase with said central service tunnel.

4,273,062
DEVICE FOR CONNECTING A SAILMAST TO A SAILBOARD
Hannes Marker, Hauptstrasse 51-53, 8100 Garmisch-Partenkirchen, Fed. Rep. of Germany, and Otto Hüss, Wallgau, Fed. Rep. of Germany, assignors to Hannes Marker, Garmisch-Partenkirchen, Fed. Rep. of Germany
Filed Mar. 29, 1979, Ser. No. 24,996
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1978, 2843551
Int. Cl.³ B63B *15/00*
U.S. Cl. 114—91 **15 Claims**



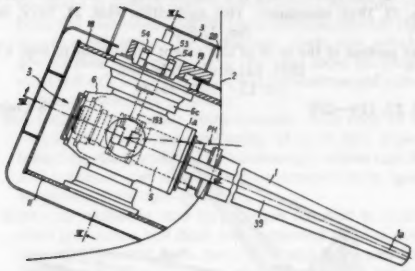
1. A device for connecting a sailmast to a sailboard comprising:
a supporting member connected to the sailmast;
a slide for positively holding the supporting member in a position for use;
a resilient element for biasing the supporting member towards the slide to the position for use;
the sailboard having a longitudinal groove formed therein for receiving the slide, the slide being longitudinally slidably guided and adapted to be releasably locked in the groove;
said resilient element urging the supporting member towards the slide when the sailmast is in any position of use and urging said slide to a position in which said slide is releasably locked.

4,273,063

SHIP STABILIZER

Jean Berne, Le Havre, France, assignor to Societe Nouvelle des Ateliers et Chantiers du Havre, Seine-Maritime, France

Filed Jun. 11, 1979, Ser. No. 47,785
Claims priority, application France, Jun. 19, 1978, 78 18241; Nov. 2, 1978, 78 31072
Int. Cl.³ B63B *39/06*
U.S. Cl. 114—126 **12 Claims**



1. A ship stabilizer with fins retractable into the hull of a ship, comprising:
- at least one pair of fins mounted on either side of the hull of the ship, each said fin being connected to a connectable casing;
- means for retracting each of said fins from an operative position into a retracted position in a housing formed in the hull of the ship below the floating line of the ship by rotating said casing;
- an auxilliary flap pivotally mounted on the rear edge of each said fin;
- inclination means for varying the angle of inclination of said fin with respect to said casing; and
- adjusting means for adjusting the inclination angle of said auxilliary flap as a function of the inclination angle of said main fin, comprising
  - a first arm fixedly connected to said auxilliary flap,
  - a connecting rod, disposed substantially perpendicular to the plane of said fin, pivotally connected at one end to said first arm and pivotally mounted at the other end thereof on said casing; and
  - means for varying the effective length of said first arm comprising a double action jack which causes the point of intersection of said first arm and said connecting rod to be moved along the axis of said first arm.

2. A ship stabilizer with fins retractable into the hull of a ship, comprising:
- a housing formed on each side of the hull of the ship;
- a monoblock, water-tight casing vertically mounted in each said housing;
- a shaft, connected at one end thereof, to each said casing;
- a stabilizer fin fixed to each said shaft;
- a double-action jack connected to said housing and to said casing to cause said casing and attached shaft and fin to rotate to and from operative and retracted positions; and
- adjusting means for adjusting the inclination angle of said fin and comprising a double action jack partly housed within said casing and connected to said shaft by means of a lever fitted on a frustoconical portion of said shaft without keying;
- wherein said casing is made water-tight by means of a bellows connected at one end to said casing and at the other end thereof to said jack of said adjusting means, said bellows being filed with oil.

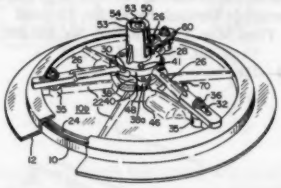
3. A ship stabilizer with fins retractable into the hull of a ship, comprising:
- a housing formed on each side of the hull of the ship;
- a monoblock, water-tight casing vertically mounted in each said housing;
- a shaft connected, at one end thereof, to each said casing;
- a stabilizer fin fixed to each said shaft;
- a double-action jack connected to said housing and to said casing to cause said casing and attached shaft and fin to rotate to and from operative and restracted positions; and
- adjusting means for adjusting the inclination angle of said fin and comprising a double action jack partly housed within said casing and connected to said shaft by means of a lever fitted on a frustoconical portion of said shaft without keying, said double action jack of said adjusting means having a hollow piston rod containing a tie rod therein, said tie rod having one end removably fixed to said shaft, the other end thereof being removeably fixed to the top of the cylinder of said jack, whereby the tie rod may be easily dismounted and then the jack brought out from the inside of the ship without intervening outside the hull.

4,273,064

HATCH COVER

Robert W. Sutton, P.O. Box 774, Port Orford, Oreg. 97465

Filed Feb. 1, 1979, Ser. No. 8,326
Int. Cl.³ B63B *19/14*
U.S. Cl. 114—203 **19 Claims**



14. An improved plate-like hatch cover for closing a hatch opening of the type having a latching mechanism at one side of the cover, which includes a rotatable hub and plural latching arms extending in different directions from the hub towards a rim of the opening, said mechanism being operable such that rotation of said hub in one direction frees said latching arms from latching engagement with the rim while rotation of said hub in the opposite direction engages said latching arms with the rim, wherein the improvement comprises:
- venting passageway defining means for defining a pressure relief passageway from one side of said cover to its opposite side;
- control means for controlling the flow of fluids through said passageway,
- said control means being coupled to said latching mechanism for automatically closing said passageway when said hub is in a latched position in which said latching arms secure the cover to the rim and for automatically opening said passageway in other positions of said hub.

4,273,065

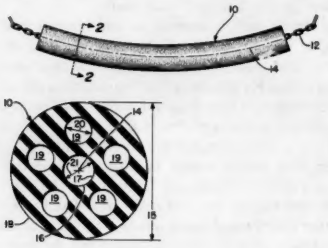
ENERGY ABSORBING DEVICE

Ronald J. Lindsay, Hudson, and Clifford W. Cross, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 6, 1979, Ser. No. 101,047
Int. Cl.³ B63B *59/02*
U.S. Cl. 114—219 **9 Claims**

1. An elastomeric energy absorption device having an overall configuration resembling that of an elongated cylinder and including a central bore extending axially throughout the length thereof and a plurality of additional holes extending axially through the length thereof, said additional holes being

symmetrically positioned around and between the inner and outer peripheral surfaces of the device, the diameter of said



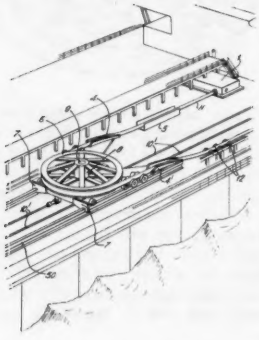
central bore being from about 1/6 to about ⅓ that of the overall diameter of the device.

4,273,066

OIL STORAGE VESSEL, MOORING APPARATUS AND OIL DELIVERY FOR THE OFF-SHORE PRODUCTION OF OIL

Harold E. Anderson, Frilsham, Nr. Newbury, England, assignor to Sea Terminals Limited, Berkshire, England

Filed Mar. 13, 1978, Ser. No. 885,591
Int. Cl.³ B65D *88/78*
U.S. Cl. 114—256 **33 Claims**



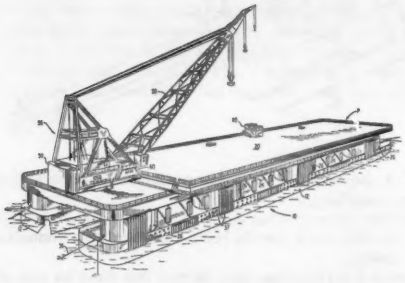
1. An oil storage vessel which is provided with (a) a flexible hose for delivery of oil, one end of said hose being adapted for connection to the oil storage capacity of the vessel; and (b) a hose guide system which is constructed so as to receive and support said flexible hose, and which comprises (i) a travelling sheave adapted to allow the flexible hose to pass around it, the sheave being mounted on guide means for travel along a track extending generally along the axis of the vessel; (ii) a first hose support channel positioned on one side of said track, for supporting the flexible hose between its connection with the oil storage capacity of the vessel and the travelling sheave; and (iii) a second hose support channel, positioned on the opposite side of said track to said first hose support channel, for supporting the flexible hose between the travelling sheave and one end of the vessel, and hose guide tongues mounted on said guide means for guiding the hose between the sheave and the first and second hose support channels whereby the flexible hose can be supported in a generally U-shaped course defined by the first hose support channel, the travelling sheave and the second hose support channel between its connection with the oil storage capacity of the vessel and said one end of the vessel.

4,273,067

METHOD OF OPERATING TWIN HULL SEMISUBMERSIBLE DERRICK BARGE

Samuel H. Lloyd, III, and Yoram Goren, both of Los Angeles, Calif., assignors to Santa Fe International Corporation, Orange, Calif.

Division of Ser. No. 732,117, Oct. 13, 1976, Pat. No. 4,150,635, which is a division of Ser. No. 650,953, Jan. 21, 1976, abandoned, which is a continuation of Ser. No. 486,588, Jul. 8, 1974, abandoned, which is a division of Ser. No. 161,865, Jul. 9, 1971, Pat. No. 3,835,800, which is a continuation of Ser. No. 705,175, Feb. 13, 1968, abandoned. This application Mar. 21, 1979, Ser. No. 22,506
The portion of the term of this patent subsequent to Sep. 17, 1991, has been disclaimed.
Int. Cl.³ B63B *35/44*
U.S. Cl. 114—258 **8 Claims**



1. A method of operating a column stabilized semisubmersible barge for marine construction, pipelaying and like other offshore operations, said barge being characterized by:

a pair of elongated hulls disposed in substantially parallel spaced side-by-side relation with each of said hulls spaced from and lying on an opposite side of the longitudinal centerline of said barge, and said barge further comprising:

a working platform spaced above said hulls a predetermined height and normally lying in a generally horizontal plane;

means for supporting said platform in fixed spaced relation above said hulls including at least three pairs of upstanding columns connecting with each of said hulls and said platform; each of said columns having a substantially constant cross sectional area over the effective height of the column between the platform and associated hull;

each of said hulls having, over substantially the entire length thereof, a substantially rectangular transverse cross section with its breadth greater than its height;

a plurality of longitudinally spaced structure means interconnecting and reinforcing the structural relationship of the hulls, platform and columns, with such structural means including substantially transversely extending members structurally interconnecting uppermost portions of the hulls;

said barge generally rectangular in plan with the length of said barge along its longitudinal centerline and roll axis being substantially greater than the width of said barge along its transverse centerline and pitch axis;

at least three of said columns being located on each of said two hulls on opposite sides of the barge's roll axis with pairs of such columns being located near opposite ends of each of said hulls on opposite sides of the barge's pitch axis and another pair of said columns being located at an intermediate position on each of said hulls;

each of said columns having an oblong cross section with a dimension extending in the direction of the barge's longitudinal axis greater than the column's dimension extending transversely of said longitudinal barge axis;

the centroid of the cross section of each column on said hulls

lying outboard of the longitudinal centerline of the associated hull;

the outboard sides of said oblong columns being substantially in vertical alignment with the outboard sides of the associate rectangular twin hulls;

the configuration and cross-sectional area of said columns throughout effective height thereof and the distances of said columns from the barge's longitudinal roll axis and transverse pitch axis being such that said columns provide sufficient righting moments about roll and pitch axis when the barge is in high draft semisubmerged operating positions and also being such that said columns provide righting moment about the transverse pitch axis which is greater than righting moment provided about the longitudinal roll axis when the barge is in semisubmerged column stabilized operating positions;

said hulls having ballast compartments, with each of said rectangular twin hulls including at least two separate ballast compartments spaced transversely within each hull and a plurality of separate ballast compartments spaced longitudinally within each hull;

means for ballasting said barge when required to alter its draft between a low draft hull-supported floating condition in which the hulls have freeboard with said transversely extending members which structurally interconnect uppermost portions of the hulls being disposed above the mean waterline and a high draft semisubmerged column stabilized floating and operating condition in which the mean waterline is located along intermediate portions of said columns above said hulls and below the underside of said platform;

crane means including a rotatable derrick mounted on said barge near one end thereof for transferring loads between spaced positions on said platform, said crane means being of sufficient size and capacity for various marine construction, pipelaying and other like offshore operations;

said means for ballasting including means for adjusting vessel angle of heel change caused during semisubmerged derrick barge operations to provide a reduction of the barge's angle of heel about its roll axis when required during semisubmerged column stabilized operations; and

said means for ballasting including means for adjusting vessel angle of trim change caused during semisubmerged barge operations to provide a reduction of the vessel's angle of trim about its pitch axis when required during semisubmerged column stabilized operations;

said method comprising the steps of:

moving the barge when required in a low draft floating condition with said rectangular cross section hulls having freeboard and with said transversely extending members interconnecting said hulls normally being above mean waterline;

ballasting the barge to submerge said hulls and also portions of said columns below the mean waterline to provide a high draft semisubmerged column stabilized floating and operating condition with the mean waterline located between the tops of the hulls and the underside of the platform;

performing operations with said crane means when said barge lies in said high draft floating semisubmerged column stabilized condition, and maintaining the barge's metacenter above the barge's center of gravity for all semisubmerged column stabilized positions and operations of the barge and said crane means;

ballasting the barge when it is in said high draft semisubmerged operating condition to adjust the barge's angle of heel about its roll axis when required during operation of said barge and crane means in said semisubmerged column stabilized condition;

ballasting the barge when in said high draft semisubmerged condition to adjust the barge's angle of trim about its pitch axis when required during said barge and said crane means operations in said semisubmerged column stabilized condition;

deballasting the barge to return the barge to the low draft condition with the hulls having freeboard.

4,273,068

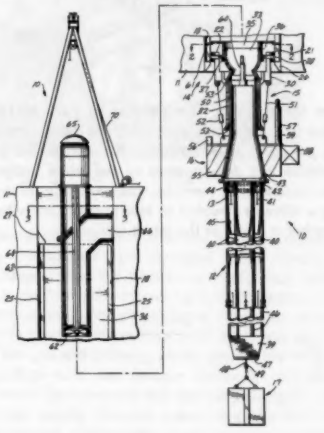
CONNECTION OF COLD WATER RISER PIPES TO SUPPORTING STRUCTURES

James F. McNary, Santa Ana, Calif., assignor to Global Marine, Inc., Los Angeles, Calif.

Filed Aug. 21, 1978, Ser. No. 935,641

Int. Cl.³ E02B *9/00*

U.S. Cl. 114—264 **17 Claims**



1. Apparatus for releasably connecting to a structure floating on the surface of an ocean the upper end of an elongate pipe assembly extending pendulously downwardly substantially vertically from the floating structure to a lower end disposed above the ocean floor, the apparatus affording a mechanism for connection of the pipe assembly to a structure at a site of use of the pipe assembly, for speedy jettisoning and release of the pipe assembly from the structure as in the event of an emergency, and for reconnection of the pipe assembly to the structure, the apparatus comprising an open-ended socket member connectable in a substantially vertical attitude to the floating structure substantially at the structure in fluid flow relation to a flow passage in the structure to open downwardly thereof with the lower end of the socket member proximate the structure, and a cooperating hollow open-ended pin member connectable to the upper end of the pipe assembly in substantially coaxial fluid flow relation to the pipe assembly and matable in the socket member, the pin and socket members being cooperatively arranged so that mating of the pin member in the socket member requires only upward linear movement of the pin member into the socket member, from below the floating structure, thereby to define a flow path from the pipe assembly through the pin and socket members to the passage, and selectively operable quick-disconnct connection means for releasably holding the pin member in mated relation with the socket member.

4,273,069

DEVELOPMENT SYSTEM

Raymond W. Huggins, Pittsford; Paul W. Burnham, Webster, and Arthur L. Torrey, Irondequoit, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 21, 1979, Ser. No. 50,717

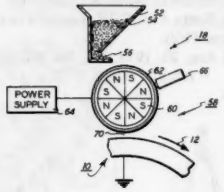
Int. Cl.³ B05C *19/00*; G05G *15/00*

U.S. Cl. 118—658 **16 Claims**

1. An apparatus for developing a latent image with particles having low conductivity, including:

a member spaced from the latent image to define a gap therebetween:

means for attracting the particles to said member, said attracting means comprising means for generating a magnetic field to attract particles to said member; and



means for reducing the particle to particle electrostatic attractive force and increasing the bulk conductivity of the particles on said member to improve the flow of the particles and development of the latent image with the low conductivity particles, said reducing means comprising a vibrator coupled to said member for vibrating said member relative to the latent image.

4,273,070

MILKING HOSE

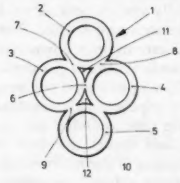
Tilman, Hoefelmayr, Niederteufen AR, Switzerland, assignor to Bio-Melktechnik Swiss Hoefelmayr & Co., Niederteufen AR, Switzerland

Filed Sep. 4, 1979, Ser. No. 72,709

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1978, 2838659

Int. Cl.³ A01J *5/00*; F16L *11/04*

U.S. Cl. 119—14.51 **5 Claims**



1. In a unitary and flexible hose arrangement having at least four separate tubular conduits therethrough, said tubular conduits extending parallel to one another, the improvement comprising wherein the central longitudinal axes of said four tubular conduits each lie substantially at the corners of a rhombus, wherein each of said four tubular conduits are held together by a connection means between the mutually adjacent segments of each of said tubular conduits, said connection means extending over the entire length of said hose arrangement, and wherein at least two further passageways, separate from each of said four tubular conduits, are provided in said hose arrangement one each between three of said connections means between the two sets of three of said mutually adjacent segments of said tubular conduits on opposite sides of the minor axis of said rhombus, said hose arrangement thereby having a greater flexibility characteristic.

4,273,071

CONTAINERS FOR TRANSPORTING POULTRY

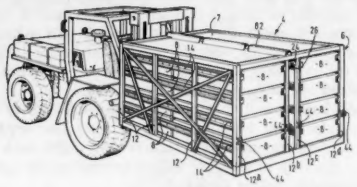
Colin R. Clark, Shucknall; Arthur R. Shore, St. Weonards, and Robert A. Corbett, Kinnersley, all of England, assignors to Sun Valley Poultry Limited, Hereford, England

Filed May 16, 1979, Ser. No. 39,505

Claims priority, application United Kingdom, May 26, 1978, 23261/78

Int. Cl.³ A01K *31/07*

U.S. Cl. 119—17 **5 Claims**



1. A container for transporting poultry from a poultry house to a processing plant, the container comprising:

a frame having opposed side walls each of which is provided with vertically-spaced mounting means, and a cover member extending between the side walls at upper parts thereof, a plurality of superposed drawers supported by the mounting means for movement between open and closed positions, and a locking mechanism carried by the frame and operable to secure the drawers in their closed positions,

wherein when the uppermost drawer is in its open position there is ready access to the interior thereof through the open top thereof and when the uppermost drawer is closed the open top thereof is closed by the cover member, and when each other drawer is in its open position, with the next drawer above it closed, there is ready access to its interior through the open top thereof and when each of the other drawers is closed, with the next drawer above it closed, the open top thereof is closed by the base of said next drawer above, and

wherein the locking mechanism is operative to lock all the drawers simultaneously, and the container comprises a lifting formation carried by the frame which is adapted to enable the container to be picked up by the transporter, the locking mechanism being associated with the lifting formation in a manner such that it is moved to lock all the drawers automatically by the picking up of the container by such a transporter.

4,273,072

PREFABRICATED WALL STRUCTURE FOR FORMING AN ENCLOSURE SUCH AS A HORSE-BOX

Daniel P. L. Choisel, 2 Muette St., The Lower Bushes, 28100 Dreux, France

Filed Oct. 2, 1979, Ser. No. 81,145

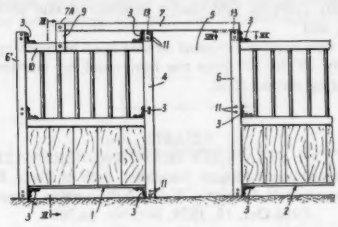
Claims priority, application France, Oct. 5, 1978, 78 28470

Int. Cl.³ A01K *1/00*

U.S. Cl. 119—27 **5 Claims**

1. A wall structure for an enclosure comprising first and second upright tubular posts, the first and second posts being spaced to define an opening therebetween which can be blocked by a door, a wall section mounted on the second post, and a crosspiece extending from the first post across said opening and beyond the second post by a distance at least equal to the width of the opening, wherein each said post has four faces defining a substantially square cross-section, and each post has two end portions in which holes are provided in each of the four faces, a sleeved nut being mounted in each of said holes, and wherein first and second elements are mounted on the crosspiece and are received in the upper end portions of the first and second posts respectively, each of said elements com-

prising two plates which cross over one another and are arranged within the respective post such that each said plate extends along a diagonal of the cross-section of the post,



screws being screwed into selected ones of said sleeved nuts to engage each said element, and wherein one end of said crosspiece is firmly connected to said wall section.

4,273,073

CIRCULATING FLUIDIZED BED BOILER

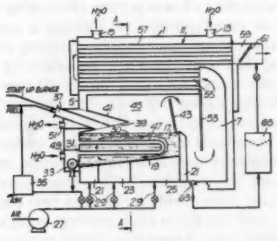
Edwin Robinson, Darlington, England, assignor to Deborah Fluidised Combustion Limited, Peterlee, England

Filed May 30, 1979, Ser. No. 43,931

Claims priority, application United Kingdom, May 31, 1978, 25699/78

Int. Cl.³ F23C *11/02*

U.S. Cl. 122—4 D **6 Claims**



1. A boiler comprising: a combustion chamber having an exterior surface, means for circulating water about the exterior surface of said combustion chamber, tubes located within said means for circulating water, means for feeding combustion gases from said combustion chamber through said tubes located within said means for circulating water, a bed for receiving particulate material, said bed being enclosed within said combustion chamber and having first and second opposite ends, said bed also having a base which is inclined upwardly from said first end thereof to said second end thereof, means for feeding air to said bed to effect fluidisation of said material and circulation of said material by movement thereof from said first end to said second end in an upper region of the bed and from said second end to said first end in a lower region of the bed, and deflection means located over the bed material adjacent said first end to limit expansion of the bed adjacent said first end.

4,273,074

COOLING DEVICE FOR HOT GASES IN PIPES

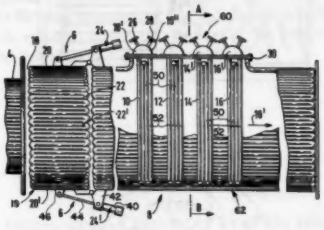
Herbert Kuhlmann, Bochum, Fed. Rep. of Germany, assignor to Sidepal Societe Anonyme Societe Industrielle de Participations Luxembourgeois, Luxembourg, Luxembourg

Filed Jul. 23, 1979, Ser. No. 59,625

Claims priority, application Luxembourg, Jul. 24, 1978, 80033

Int. Cl.³ F22D *1/00*

U.S. Cl. 122—7 R **8 Claims**



1. A cooling device for use in a tubular hot gas conduit of the type having longitudinal pipes arranged in side-by-side abutting relationship around the conduit circumference, said conduit having a gas flow path extending therethrough in a longitudinal direction, said conduit having an open end adopted to be mounted in spaced relationship from a hot gas supply for receiving a hot gas and defining an air gap for the flow of air into the gas flow path, and damper means for adjusting the spacing between the open end and the hot gas supply relative to the hot gas supply thereby controlling the flow of air through the air gap, comprising, in combination therewith, a plurality of registers arranged in spaced relationship along the length of said conduit and extending across said conduit transverse to the flow path, each of said registers including a plurality of tubes connected into one side of said hot gas conduit and extending through said hot gas conduit substantially to the other side thereof, each of said tubes having an inflow portion extending into said hot gas conduit from one side for passing a flow of a medium to the opposite side of said conduit and an outflow portion connected to said inflow portion for passing a flow from said opposite side to the one side for the outflow of the cooling medium.

4,273,075

HEAT GENERATING DEVICE

Dean A. Freihage, Afton, Iowa 50830

Filed Sep. 7, 1979, Ser. No. 73,221

Int. Cl.³ F22B *3/06*; F24C *9/00*

U.S. Cl. 122—26 **5 Claims**

1. A heat generator, comprising:

a sealed drum of heat conducting material,

a shaft axially mounted in said drum and projecting from one end thereof,

means for rotating said shaft,

a plurality of hubs keyed to said shaft in longitudinal spaced relationship thereon,

the perimeter of each hub being provided with an endless succession of continuous notches with each notch having a short side extending radially inwardly to a long side extending laterally therefrom and tangentially back to the perimeter to the point of the next short notch side,

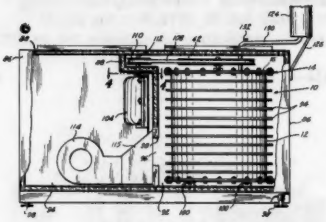
a respective elongated flat bar vane seated in respective aligned notches on said hubs and secured thereto,

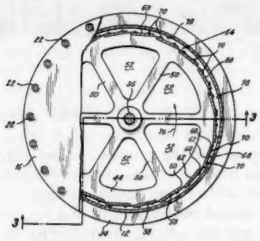
relative to the direction of rotation of said hubs, the vane side seated against said short notch side defined as the leading vane edge and the opposite vane edge being the trailing edge,

the leading edge of each vane being spaced inwardly from

the trailing edge of an adjacent vane to define a restricted passageway therebetween,

a supply of oil in said drum, and





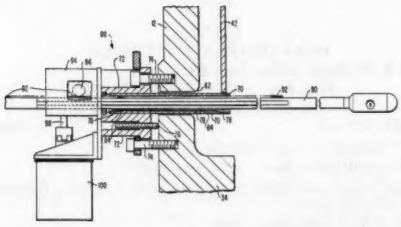
the rotation of said hubs and vanes acting to forcibly drive said oil through said passageways in heat generating friction contact to effectively heat said drum from which the heat is radiated.

4,273,076

STEAM GENERATOR SLUDGE LANCING APPARATUS

Edward J. Lahoda, Edgewood, and Thomas H. Dent, Greensburg, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 28, 1978, Ser. No. 974,178
Int. Cl.³ F22B *37/52, 37/54*
U.S. Cl. 122—382 **11 Claims**



1. Apparatus for removing sludge deposits from steam generators comprising:

a mounting plate capable of being attached to said steam generator;

a first tubular member having a plurality of outlet openings therein attached to said mounting plate and capable of being disposed through an opening in said steam generator;

a second tubular member disposed within said first tubular member defining a first annular chamber therebetween for conducting a first fluid to said outlet openings for establishing a peripheral flow within said steam generator;

a third tubular member having a first bore therein slidably disposed within said second tubular member for conducting a pulsating second fluid to said sludge deposits;

a head mounted on the end of said third tubular member for directing said second fluid toward said sludge deposits thereby carrying said sludge deposits to said peripheral flow; and

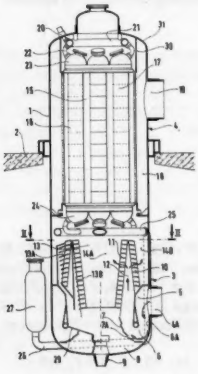
at least two nozzles mounted on said head between approximately 20° to 30° from the horizontal for emitting said pulsating second fluid.

4,273,077

VERTICAL STEAM SEPARATOR-SUPERHEATER

Roger Bessouat, and Jacques Marjollet, both of Paris, France, assignors to Stein Industrie, Velizy-Villacoublay, France

Filed Oct. 15, 1979, Ser. No. 84,709
Claims priority, application France, Oct. 18, 1978, 78 29673
Int. Cl.³ F22G *1/00*
U.S. Cl. 122—483 **4 Claims**



1. A vertical steam separator-superheater comprising a common casing (1) enclosing a lower portion (3) forming a speparation zone and an upper portion (4) forming a superheating zone, said separator-superheater further including an axial dry steam inlet zone (15), nests (16, 17) of superheating tubes disposed in envelopes spaced out round the central zone and fixed to a thin and flexible casing (30), said thin and flexible casing itself being fixed to the upper portion of the common casing and defining a peripheral superheated steam collection zone (18) the improvement wherein the lower portion includes an annular wet steam inlet chamber (5), wet steam inlet openings (4A) and separator components grouped in two coaxial truncated pyramids, said wet steam inlet openings being connected to said wet chamber, said pyramids including an outer pyramid (10) whose large base is lower than its small base and an inner pyramid (11) whose large base is higher than its small base, and wherein said annular inlet chamber communicates via an annular passage (6) with the volume contained between the outer pyramid and the inner pyramid.

4,273,078

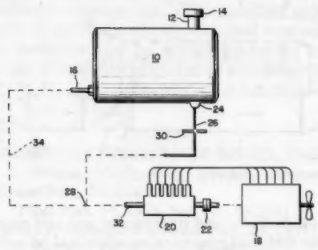
FUEL SUPPLY SYSTEM

Eric C. Cottell, Private Rd., Bayville, N.Y. 11709

Filed Dec. 11, 1978, Ser. No. 968,582
Int. Cl.³ F02M *37/00*
U.S. Cl. 123—25 R **1 Claim**

1. A fuel supply system for a diesel engine comprising a fuel injection pump, a supply tank, a main fuel conduit means leading from the tank to said injection pump for supplying oil to the combusiton chambers of the diesel engine and a secondary fuel conduit leading from the lower-most region of the tank to said main fuel conduit means upstream of said injection pump, said

secondary fuel conduit including flow restriction means and constituting means for continuously delivering water of condensation or accidentally injected in the tank or in the absence thereof a small part of the fuel delivered to said injection pump to be mixed with the major part of the fuel delivered to said injection pump along said main fuel conduit means, said conduits and said pump comprising means for removing any water in the lower-most region of said tank and for emulsifying the same with the fuel delivered along said main fuel conduit means, whereby the build-up of bacteriological sludge in said tank is avoided and pure oil is delivered to said injection pump through said conduits when water of condensation or accidentally injected in the tank is not present in the tank.



4,273,079

AIR-COMPRESSING DIRECT INJECTION INTERNAL COMBUSTION ENGINE

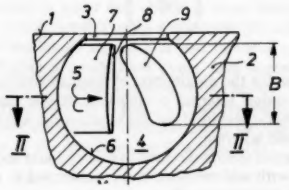
Uwe Buddenhagen, Munich, Fed. Rep. of Germany, assignor to Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Nürnberg, Fed. Rep. of Germany

Continuation of Ser. No. 823,136, Aug. 9, 1977, abandoned. This application Oct. 9, 1979, Ser. No. 82,942

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1977, 2635847

Int. Cl.³ F02B *19/00*

U.S. Cl. 123—276 **4 Claims**



1. In an air-compressing direct injection internal combustion engine having a cylinder with a first member represented by a cylinder head for said cylinder and with a second member represented by a piston reciprocable in said cylinder and having a compression stroke, said members including a combustion chamber including a substantially cylindrical wall and having a center axis extending therethrough which lies in a plane located vertically with respect to the chamber in one of said members and including moving air compressed by the piston in said combustion chamber, the major portion of the cylindrical wall of said combustion chamber resulting from geometric rotation of the plane through approximately 270° about the axis of the chamber, and said combustion chamber having a constricted opening for passage of combustion air and gases moved upon relative movement of said members, said chamber containing substantially all the combustion air and gases at the compression stroke, and also being adapted to form a film of fuel on said wall, said wall having an improvement in combination therewith comprising a discontinuity extending longitudinally along said wall in front of the moving air and at least as long as the length of said film on the wall so that the air moving along said wall strikes said discontinuity, said discontinuity particularly being formed by an arrangement including a step and a segment of said wall having its surface extended radially outward of said cylindrical wall, the step of the arrangement rising radially towards the combustion chamber center axis and including a radial surface formation as a tripping hump extending radially outwardly from said cylindrical wall with a radius increasing in direction of rotation relative to said surface of said segment outwardly of said cylindrical wall, so that the laminar boundary of said moving air is destroyed by said step to result in improved removal of the fuel in said fuel film while the main flow of air is unaffected.

4,273,080

EXHAUST GAS CONDUIT SYSTEM FOR MULTI-CYLINDER RECIPROCATING PISTON INTERNAL COMBUSTION ENGINES

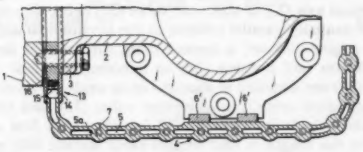
Heinz Pluequet, Cologne, Del.X, assignor to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Oct. 4, 1978, Ser. No. 948,438

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1977, 2744964

Int. Cl.³ F01P *11/20*

U.S. Cl. 123—41.5 **6 Claims**



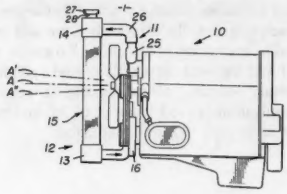
1. An exhaust gas conduit system for a multi-cylinder reciprocating piston internal combustion engine having its cylinders arranged in at least one cylinder row and respectively provided with a cylinder head and an exhaust gas conduit, in which said exhaust gas conduits respectively establish communication between the respective cylinder and the pertaining cylinder head, and which includes water cooled insulating walls respectively surrounding said exhaust gas conduits as well as having water chambers therewith and extending in the longitudinal direction thereof and being formed by water chamber forming wall sections of said insulating walls and by ribs supporting said water chamber forming wall sections relative to each other; wherein each insulating wall comprises a plurality of longitudinal sections provided with connecting flanges, adjacent connecting flanges forming with each other water chambers adapted to be connected to supply and withdraw conduits for circulating cooling water; and in which said insulating walls are at their connecting area with the respective exhaust gas conduit provided with recesses having inserts sealingly connected thereto, and in which said exhaust gas conduits are connected to the pertaining cylinder head by flanges having recesses therein, said inserts on the one hand forming with the respective insulating walls an annular water chamber interconnecting the pertaining longitudinal water chambers and on the other hand being guided on a spacer ring between the respective cylinder head and the pertaining flange while a heat resistant O-ring is interposed between a spacer ring in the respective insert and the adjacent insulating wall.

4,273,081

VENT VALVE FOR ENGINE COOLING SYSTEMS

Gary L. Cleveland, Washington, and Clyde O. Taylor, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 27, 1979, Ser. No. 57,480
Int. Cl.³ F01P 7/14
U.S. Cl. 123—41.08 14 Claims



1. In a cooling system (11) for an engine (10) disposed on a longitudinal axis (A) thereof and comprising a first chamber (19) defined in said engine (10), a second chamber (20) defined in said cooling system (11), thermostat means (17) for normally preventing coolant from communicating from said first chamber (19) to said second chamber (20) and for opening to communicate coolant from said first chamber (19) to said second chamber (20) in response to the temperature of coolant in said first chamber (19) rising above a predetermined level, and a vent valve (32) including a housing (33) having an inlet (34) and an outlet (37), a third chamber (42) defined in said housing (33), a first ramp surface (43) defined internally on said housing (33) and terminating at an annular seat (44) at said outlet (37) to define a first acute angle (a) relative to a longitudinal axis (X) of said vent valve (32), and a valve element (41) disposed in said third chamber (42), the improvement comprising the longitudinal axis (X) of said vent valve (32) being disposed at least substantially parallel relative to the longitudinal axis (A) of said engine (10) and a second ramp surface (45) defined internally on said housing (33) to intersect said first ramp surface (43) and disposed at a second acute angle (b) relative to the longitudinal axis (X) of said vent valve (32), said second acute angle (b) being substantially less than said first acute angle (a), the length of said second ramp surface (45) in the direction of the longitudinal axis (X) of said vent valve (32) and the volume of said third chamber (42) each being substantially greater than the size of said valve element (41), said valve element movable from a first position substantially remote from said seat to permit unobstructed flow of air from said inlet (34), through said third chamber (42), and to said outlet, to a second position engaging said seat by moving sequentially along said second (45) and first (43) ramp surfaces in response to liquid coolant at least substantially filling said first (19) and third (42) chambers.

4,273,082

COOLING SYSTEM FOR VEHICLE DRIVE

Paul Tholen, Bergisch Gladbach, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Sep. 13, 1978, Ser. No. 941,865
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1977, 2741244
Int. Cl.³ F01P 1/06, 3/12
U.S. Cl. 123—41.31 3 Claims

1. A cooling system for an air cooled vehicle drive, which comprises:

an internal combustion engine;

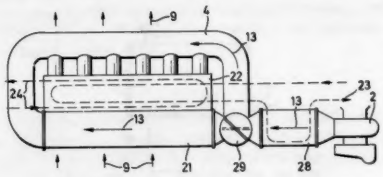
a transmission operatively connected to said engine;

a retarder operatively connected to said engine;

a supercharger intercooler system operatively connected to said engine;

ducts for conducting oil to and from said internal combustion engine, said transmission, and said retarder, some of said ducts passing at least partially through said supercharger intercooler system; and

at least one air cooled heat exchanger for cooling oil for said retarder and said transmission, said supercharger intercooler system comprising a main cooler and a precooler,



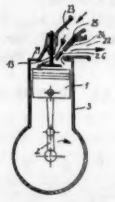
said oil ducts for said transmission and said retarder passing through said precooler, an additional oil cooler which follows said main cooler in the direction of flow of cooling air, and a controllable bypass which precedes said main cooler in the direction of flow of charging air.

4,273,083

DISTRIBUTION SYSTEM FOR THE INTAKE AND EXHAUST OF A SUPER CHARGED INTERNAL COMBUSTION ENGINE

Auguste Moiroux, 28 Route de Dardilly, Ecully, (Rhone), France

Filed Jan. 24, 1978, Ser. No. 871,825
Claims priority, application France, May 16, 1977, 77 16035
Int. Cl.³ F01L 1/28
U.S. Cl. 123—79 R 11 Claims



1. A system for the distribution of fresh air and burnt gases in a reciprocating internal combustion engine, said engine having an exhaust manifold, an intake manifold, a cylinder and a cylinder head wherein:

a flow of active fluid is directed to said cylinder and is in part parallel with said cylinder, and is connected to said cylinder by a connecting valve;

said cylinder head including said exhaust manifold, with said exhaust manifold being opposite said cylinder, and extending substantially directly above said cylinder and being connected to said cylinder by said connecting valve;

said intake manifold being supplied with air by a supercharging turbo-compressor and being connectable to said exhaust manifold by a second valve;

said second valve which connects said intake manifold to said exhaust manifold being disposed at a distance from said connecting valve, wherein;

said second valve is disposed downstream of said connecting valve with respect to the exhaust gas manifold in one position, wherein;

said second valve by means of which said intake manifold opens into said exhaust manifold comprises an oscillating flap valve which is movable between two extreme positions in which it respectively closes-off said intake manifold and said exhaust manifold; and wherein:

said flap valve comprises a movable edge which moves in the vicinity of a first edge of a stationary deflector of the

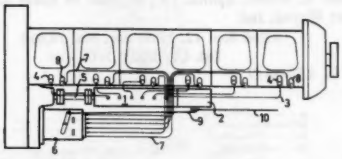
chamber of said connecting valve, the second edge of said deflector being disposed in the immediate vicinity of said connecting valve, such that during movement of said oscillating valve between the two extreme positions thereof there is an intermediate position of said flap valve in which it substantially forms an extension of said stationary deflector, whereby said intake manifold and exhaust manifold are both provisionally extended separately as far as the immediate vicinity of said connecting valve, on either side of said flap valve and of said deflector.

4,273,084

FUEL INJECTION SYSTEM FOR DIESEL ENGINES

Heinz E. A. Holmer, Gothenburg, Sweden, assignor to AB Volvo, Gothenburg, Sweden

Filed Nov. 15, 1978, Ser. No. 962,031
Claims priority, application Sweden, Nov. 23, 1977, 7713231
Int. Cl.³ F02N *17/08*; F02B *3/06*
U.S. Cl. 123—179 L **8 Claims**



1. In a fuel injection system for direct injection diesel engines with a depression in the tops of the pistons, said system comprising a first injection pump with a regulator and accompanying first injector for each cylinder, said injectors being disposed to spray the fuel in a zone around the center axis of the respective piston depression; the improvement comprising a second injection pump (6) with a regulator and accompanying second injectors (8) for each cylinder, said second injectors being disposed to inject fuel obliquely from the side into the respective piston depression in a direction (B) counter to the rotation of the intake air, both of said injection pumps being operable during a combustion cycle, said second pump (6) being arranged to permit injection of fuel before fuel from the first pump (1) is injected so that the compression combustion of the fuel from the second injection pump (6) can initiate the combustion of the fuel from the first pump (1).

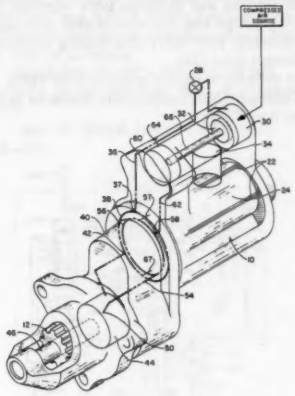
4,273,085

AIR STARTER

Leon P. Janik, Jr., No. 3 Hoover La., Hazardville, Conn. 06036

Division of Ser. No. 809,103, Jun. 22, 1977, Pat. No. 4,170,210.
This application Nov. 22, 1978, Ser. No. 963,030
Int. Cl.³ F02N *7/08*
U.S. Cl. 123—179 F **6 Claims**

1. An air starter including an air motor having an air inlet suited for receiving air from a source of high pressure to power the air motor, a main air valve in said inlet for controlling the delivery of air to power said air motor, a pneumatic piston for actuating said valve to move the same against the bias of the incoming pressure to open the valve to permit the entry of air into the air motor, a first chamber associated with said valve, means for automatically entrapping a quantity of lubricant in said first chamber and for discharging the same into the incoming air stream as the main control valve moves to its open position, a second chamber associated with said valve, means for automatically entrapping a quantity of fluid in said second chamber during the closing movement of said valve, and means for controlling the discharge of said fluid during such closing movement to regulate the rate of closing movement



under the bias of incoming air pressure to minimize the shock imposed by the closing of the valve.

4,273,086

DEVICE AND METHOD FOR FREEING FROZEN ENGINE CYLINDERS

Robert K. Hayden, Box 488, LaPlata, Md. 20646

Filed Jun. 12, 1979, Ser. No. 33,754
Int. Cl.³ F02B *77/00*, *75/12*
U.S. Cl. 123—198 R **1 Claim**

1. A device for freeing frozen pistons in the cylinders of an internal combustion engine comprising a fitting being adapted at one end to be placed in an existing engine spark plug or injector hole, said fitting at its other end being adapted as a grease gun lubrication fitting and further having a passage from the lubrication fitting at the one end to the other end and opening into the combustion chamber of said engine when the device is fitted into the spark plug or injector hole; whereby grease under pressure may be applied to the cylinder of a frozen piston in order to free the said piston.

4,273,087

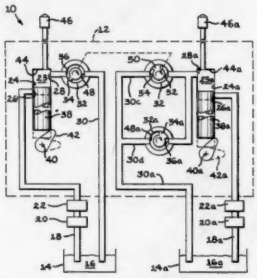
DUAL FUEL ROTARY CONTROLLED PILOT AND MAIN INJECTION

Alexander Goloff, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 22, 1979, Ser. No. 102,193
Int. Cl.³ F02M *43/00*
U.S. Cl. 123—299 **9 Claims**

1. A fuel injection apparatus comprising:
means for defining a first plunger bore (24);
a first plunger (38) reciprocally mounted in said first plunger bore (24);

means (**18,30**) for conducting a first fuel (**16**) to and from said first plunger bore (**24**);
a first nozzle (**46**);
means for starting and stopping pilot injection of said first fuel (**16**) through said first nozzle (**46**), said means including a rotatable first valve (**32**) fluidly connected to said first plunger bore (**24**);
means for defining a second plunger bore (**24***a*);
a second plunger (**38***a*) reciprocally mounted in said second plunger bore (**24***a*);



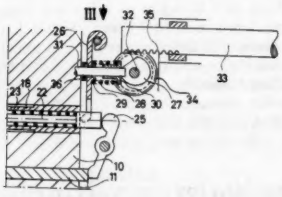
means (**18***a*,**30***a*) for conducting a second fuel (**16***a*) to and from said second plunger bore (**24***a*);
a second nozzle (**46***a*);
means for starting main injection of said second fuel (**16***a*) through said second nozzle (**46***a*), said means including said first valve (**32**) fluidly connected to said second plunger bore (**24***a*); and
means for stopping main injection of said second fuel (**16***a*), said means including a rotatable second valve (**32***a*) fluidly connected to said second plunger bore (**24***a*).

4,273,088

APPARATUS FOR SETTING THE ANGULAR RELATIONSHIP BETWEEN ROTATING DRIVING, AND DRIVEN MEMBERS

Eberhard Hofmann, Kirchberg; Ernst Ritter, Stuttgart, and Heinrich Staudt, Markgröningen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 22, 1979, Ser. No. 14,199
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1978, 2807737
Int. Cl.[3] **F02D** *1/04;* **F02M** *39/00*
U.S. Cl. 123—502 **14 Claims**



1. In an apparatus for setting the angular relationship between a rotating drive member and a driven member in the drive of a fuel injection pump of an internal combustion engine, said drive including: the drive member having a toothed portion; the driven member having a toothed portion; and a coupler having toothed portions complemental to the toothed portions of the drive member and the driven member, with at least one of the toothed portions of the drive member and driven member and the complemental toothed portion of the coupler being helical toothed portions, said apparatus including hydraulic displacement means for hydraulically displacing the coupler and thereby at least the driven member to attain an rpm-dependent adjustment of the instant of injection, said hydraulic displacement means including: a valve member; at least one spring; and a centrifugal governor having flyweights which produce an rpm-dependent displacement of the valve member against the force exerted by said at least one spring, and thereby the hydraulic displacement of the coupler and at least the driven member,

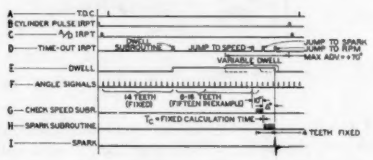
the improvement in the apparatus comprising load-dependent displacement means connected to the hydraulic displacement means for further displacing the coupler and thereby at least the driven member in a load dependent manner, to attain a further adjustment of the instant of injection which is load-dependent, said load dependent displacement means including at least one prestressed spring.

4,273,089

OPEN LOOP COMPUTER-CONTROLLED SPARK IGNITION TIMING SYSTEM

Thomas A. Maier, Apollo, Pa., assignor to Essex Group, Inc., Fort Wayne, Ind.

Filed Sep. 12, 1979, Ser. No. 74,614
Int. Cl.[3] **F02P** *5/04*
U.S. Cl. 123—417 **4 Claims**



1. Electronic spark angle timing apparatus for a spark ignition, internal combustion engine, comprising:
means for providing cylinder signals indicative of the occurrence of each cylinder-related sub-cycle of the engine;
means for providing engine angle signals delineating angular rotation of the engine within each cylinder-related sub-cycle of engine rotation, said engine angle signals indicating angles of rotation which are much smaller than the angles of rotation to each cylinder-related sub-cycle of the engine;
means operative in response to inlet manifold pressure of the engine for providing pressure signals indicative of engine loading; and
signal processing means including a source of clock signals and repetitively operative in relation to successive cylinder-related engine sub-cycles in response to said cylinder signals, said engine angle signals and said pressure signals,
for providing engine speed-related signals in response to said clock signals and said engine angle signals,
for counting a fixed number of said engine angle signals while concurrently, first, providing firing angle signals indicative of the desired spark firing angle as a function of engine speed and load in response to said speed-related signals and said pressure signals, and, second, providing, in response to said firing angle signals, count signals, dependent upon the number of said engine angle signals in excess of said fixed member which are produced within a desired delay angle which extends between the angle at which said cylinder signals appear and a related desired spark firing angle, and remainder signals dependent upon a portion of said desired delay angle in excess of the aggregate angle represented by the number of said engine angle signals indicated by said corresponding count signals, and
for counting a number of said engine angle signals produced subsequent to one of said cylinder signals in

dependence on said related count signals and for thereafter counting a number of said clock signals determined by related ones of said remainder signals and said speed signals to provide a signal indicating the time of the desired spark firing angle represented by said firing angle signals.

4,273,090

FUEL INJECTION PUMP

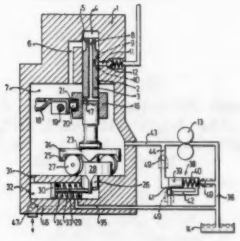
Gerald Höfer, Weissach-Flacht; Karl Konrath, Ludwigsburg; Franz Eheim; Otmar Weiss, both of Stuttgart; Edgar Schmitt, Möglingen; Werner Faupel, Gerlingen, and Edgar Götz, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 25, 1977, Ser. No. 844,933

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1976, 2648043

Int. Cl.[3] F02M *59/34*

U.S. Cl. 123—502 13 Claims



1. In a fuel injection pump for an internal combustion engine having: a fuel sump; a housing; a working cylinder defined within the housing which receives fuel from the fuel sump; a pump piston mounted for movement within the working cylinder; drive means for effecting the movement of the pump piston; adjusting means including an adjustable piston and restoring force means, said adjustable piston being displaceable against the force of the restoring force means, for adjusting the drive means and thus the movement of the pump piston; a fuel passage leading to the fuel sump; fuel supply means for supplying fuel through the fuel passage to the fuel sump; and pressure control means for controlling the pressure of the fuel supplied by the fuel supply means through the fuel passage, at least in accordance with engine speed and by means of controlling the flow of a partial quantity of fuel back to the fuel supply means, the pressure control means including a movable member and a spring for exerting a closing force against the movable member, the movable member controlling the fuel passage and being subjected to the fuel pressure in the passage, which is exerted against the movable member in opposition to the closing force, the improvement comprising:

a control member; and

a heatable thermostat including a working element of expansible material operative at least during engine starting and until engine warm-up, for actuating the control member for controlling the flow of a partial quantity of fuel back to the fuel supply means, wherein:

(i) the control member and the heatable thermostat form part of the pressure control means;

(ii) the closing force exerted by the spring is varied by the control member during the actuation thereof by the heatable thermostat; and

(iii) the pressure control means, the control member and the heatable thermostat effect a relative reduction of a total partial quantity of fuel back to the fuel supply means and a corresponding relative increase in the fuel supply pressure in the fuel sump.

4,273,091

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

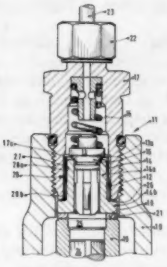
Gerhard Stumpp, Stuttgart; Max Greiner, Gerlingen; Otmar Weiss, Stuttgart, and Karl Konrath, Ludwigsburg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 20, 1979, Ser. No. 59,353

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1978, 2842155

Int. Cl.[3] F02M *59/02;* F04B *39/10*

U.S. Cl. 123—506 7 Claims



1. A fuel injection pump for internal combustion engines, particularly Diesel engines having a pressure valve disposed between the pump working chamber and the pressure line leading to the injection nozzle, said pressure valve including a flange on its lower terminal end remote from said pressure line, said pressure valve arranged to be pressed by the end face of a hollow-cylindrical threaded connection element having an inner disposed wall downwardly toward a pump cylinder, and an annular chamber disposed between said inner wall of the threaded connection element and said pressure valve, further wherein a protective sealing means is positioned in said chamber, said sealing means further including at least two annular contact surfaces axially displaced relative to one another and one each of which contact surfaces is arranged to engage said pressure valve and said inner wall of said threaded connection element.

4,273,092

EXHAUST GAS RECIRCULATION SYSTEM WITH ENGINE LOAD DEPENDENT PERFORMANCE

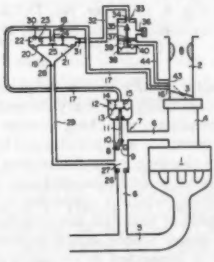
Hidemi Onaka, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jul. 18, 1979, Ser. No. 58,518

Claims priority, application Japan, Dec. 22, 1978, 53-160593

Int. Cl.[3] F02B *47/08*

U.S. Cl. 123—568 2 Claims



1. An exhaust gas recirculation system for an internal com-

bustion engine comprising an exhaust passage, an inlet manifold, and a throttle valve in said inlet manifold, comprising:

an exhaust gas recirculation passage leading from a part of said exhaust passage to a part of said inlet manifold downstream of said throttle valve;

an orifice element provided within said exhaust gas recirculation passage;

an exhaust gas recirculation control valve, downstream of said orifice element in said exhaust gas recirculation passage, so as to define a pressure chamber in said exhaust gas recirculation passage between itself and said orifice element, comprising:

a first diaphragm;

a first diaphragm chamber, defined on one side of said first diaphragm,

a first valve element coupled to said first diaphragm;

and a first valve port cooperating with said first valve element to form a variable aperture in said exhaust gas recirculation passage, so that an increase in the vacuum supplied to said first diaphragm chamber increases the opening amount of said variable aperture;

a first passage which supplies vacuum to said first diaphragm chamber;

a vacuum control valve, which comprises:

a second diaphragm;

a second diaphragm chamber, defined on one side of said second diaphragm to which is admitted the pressure of the exhaust gas in said pressure chamber;

a third diaphragm chamber, defined on the other side of said second diaphragm;

a second valve port communicating with said third diaphragm chamber to said first passage; and,

a second valve element, supported by said second diaphragm, and cooperating with said second valve port so as to close said second valve port when the pressure in said second diaphragm chamber exceeds the pressure in said third diaphragm chamber by more than a certain amount, and so as to open said second valve port when the pressure in said second diaphragm does not exceed the pressure in said third diaphragm chamber by more than said certain amount;

and a means for admitting atmospheric air into said third diaphragm chamber, whose resistance to the passage of said atmospheric air is varied, in accordance with the inlet vacuum at a point in said inlet manifold which is upstream of said throttle valve when said throttle valve is opened to less than a certain predetermined opening, and which is downstream of said throttle valve when said throttle valve is opened to more than said predetermined opening, in such a way that said resistance is minimum when the vacuum at said point is minimum, and maximum when the vacuum at said point is maximum.

4,273,093

NON-CONTACTOR IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Masayuki Ozawa, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

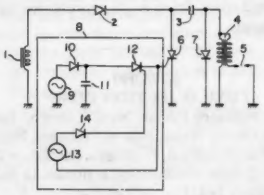
Filed Sep. 6, 1979, Ser. No. 73,136

Claims priority, application Japan, Sep. 29, 1978, 53-121003

Int. Cl.³ F02P *3/12*

U.S. Cl. 123—653 **4 Claims**

1. In a non-contactor ignition system for generating an ignition voltage while controlling a primary current of an ignition coil by a first semiconductor switching element, the improvement comprising: a capacitor which is charged by a first power source and repeats a charging and a discharging operation in a predetermined period; a second semiconductor switching element for ignition timing which is connected to the capacitor and the input terminal of said first semiconductor switching element; a second power source which generates an output voltage and which is connected in the input circuit of said second semiconductor switching element for ignition timing and whose value is varied depending upon the variation of revolution velocity of an engine and which has a charging period including at least the charging period of said capacitor; and a third power source which is connected in parallel to said



second power source and whose output voltage is steep and remarkably higher than the output voltage of said second power source.

4,273,094

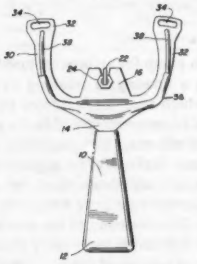
SLINGSHOT

Frank M. Hogan, 250 Sierra Vista, Tucson, Ariz. 85731

Continuation of Ser. No. 839,215, Oct. 3, 1977, abandoned. This application Sep. 27, 1979, Ser. No. 79,340

Int. Cl.³ F41B *7/00*

U.S. Cl. 124—20 R **4 Claims**



1. In a slingshot, a substantially heavy handle tapering upwardly from the base, a sight tapering upwardly from the upper end of the handle, a V-groove in the upper medial end of the sight, an aperture below the V-groove, a forwardly extending, horizontal rod in said aperture and secured thereto, a blade on the forward end of said rod and aligned with said V-slot, a pair of legs integrally formed on the upper end of said handle each extending upwardly and rearwardly and radially and terminating in a flattened portion, said flattened portion bent at an angle, a rectangular opening in each of said flattened portions, a tube integrally secured to the upper end of said handle and spaced away therefrom and positioned on the front of said device, said tube extending outwardly in opposite directions from said point of securement with the free ends being bent upwardly radially, a rod anchored medially in said tube and extending outwardly of said tube in opposite directions and both ends bent at a radius towards said arms and each terminating below and adjacent said rectangular opening, a pair of rubber tubes, one end of each rubber tube inserted through the rectangular openings and slidable on the rods and the integral tube, a soft, resilient, rectangular shaped piece of leather, apertures in each end of said leather, the free end of said tubes inserted in and through one of each of said apertures and bent over itself, and means for anchoring said bent-over portions of said tube.

4,273,095

PNEUMATICALLY-OPERATED BALL PROJECTING DEVICE

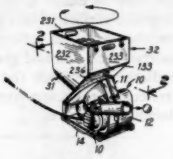
Richard Speer, Oak Hall, Ware Neck, Va. 23178

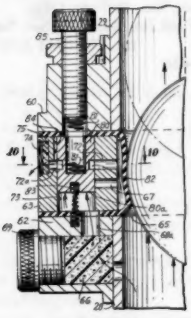
Continuation of Ser. No. 894,162, Apr. 6, 1978, Pat. No. 4,212,284, and a continuation-in-part of Ser. No. 764,197, Jan. 31, 1977, Pat. No. 4,094,294. This application Jul. 12, 1979, Ser. No. 57,105

The portion of the term of this patent subsequent to Jun. 13, 1995, has been disclaimed.

Int. Cl.³ F41F *1/04*

U.S. Cl. 124—56 **3 Claims**





1. In a pneumatic device for projecting a ball, the device comprising a ball-directing tube defining a generally tubular inner space, gas pressure supply means operatively connected to a first end of the tube to provide gas under pressure thereto, means for feeding a ball into the tube for movement along the tubular inner space in a direction from the first end of the tube toward the second end of the tube, and detent means in the tube for transiently restraining the movement of a ball therethrough until a predetermined pressure is developed behind the ball, the improvement comprising pressure-operated detent means comprising:

an inflatable member within said tube, the member having a first inflated configuration extending into the tubular inner space, defining a substantially pressure-tight detent volume, so as to constrict the tubular inner space and thus restrain the movement of a ball therethrough, and a second deflated configuration permitting the movement of a ball along the tubular inner space;

connecting means for increasing the fluid pressure within such detent volume as the gas pressure behind the ball is increased;

exhaust means for releasing the fluid pressure within the detent volume when the gas pressure behind the detained ball reaches a predetermined value;

whereby the detent means deflates thus releasing the ball for movement along the tubular inner surface, the ball being projected by the gas pressure developed therebehind.

4,273,096

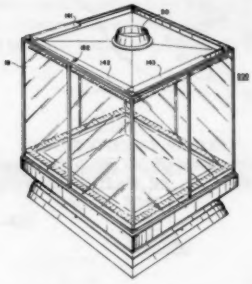
FIREPLACE

Harold Hannebaum, 420 E. Walnut St., P.O. Box #437, Bellevue, Id. 83313

Continuation-in-part of Ser. No. 843,827, Oct. 20, 1977, Pat. No. 4,181,117, which is a continuation-in-part of Ser. No. 762,014, Jan. 24, 1977, abandoned. This application Sep. 19, 1978, Ser. No. 943,842

Int. Cl.³ F24B *1/18*

U.S. Cl. 126—120 **2 Claims**



1. A heating unit comprising:

a firebox;

a vertically elongated hollow member formed primarily of transparent material, said member being open at both ends and secured at its lower end to the firebox; and

a hollow top section having a relatively small open end conforming to and engaging the upper end of said hollow member, said top section having a narrow horizontal peripheral border formed with at least one opening communicating with the interior of the hollow member, said border having essentially the same perimeter as that of said member, wherein

said border has a louver mounted to said border located so as to direct the flow of air through the border opening, wherein

said opening and said louver are located in said border in a position so that a fire in the firebox causes air to be drawn into the interior of the hollow member, when the forebox is in use, with said louver oriented so as to direct said drawn air intitially along a vertically down extending path in the fire, with the exhaust gases in the forebox being then discharged upwardly through said chimney, in which

a hinged cover unit is pivotally mounted externally to the top section and located to block the opening of the border in the closed position of the cover, together with spring means to bias the cover to the closed position and screw means to pivot the cover away from the closed position so as to regulate the size of opening leading into the interior of the hollow member, in which

the border is formed with a plurality of sets of openings with a separate cover pivotally mounted externally of each set of openings, and with the said covers in frictional engagement with each other so that a single spring means biases all covers to the closed position and a single screw means serves to adjust all the covers away from the closed position.

4,273,097

AUTOMATIC FIREPLACE DAMPER

Henry S. Szwartz, 17 Terrace Ave., Suffern, N.Y. 10901

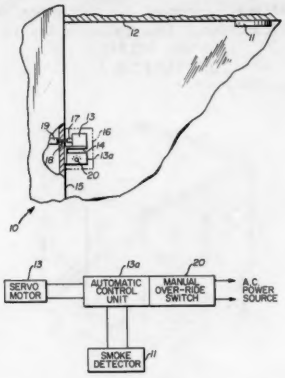
Filed Apr. 24, 1978, Ser. No. 898,772

Int. Cl.³ F23L *1/00*; F23N *3/00*

U.S. Cl. 126—285 B **5 Claims**

1. A firebox with a flue and damper, comprising a smoke detector located in a room with the firebox, an automatic

control unit for controlling a servo-motor secured to said flue, said servo-motor acting to open and close said damper, a manual override switch for controlling said servo-motor operation when desired, and bracket means securing said servo-motor



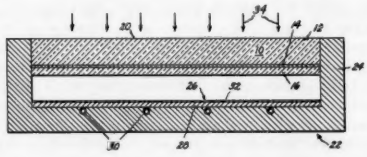
and said automatic control unit to said flue, said automatic control unit being activated by said smoke detector to open said damper in incremental steps when smoke enters said room by closing an alternating current circuit to said servo-motor.

4,273,098

TRANSPARENT COMPOSITE LAMINAR STRUCTURE, SOLAR COLLECTOR AND METHOD

Seth D. Silverstein, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 2, 1979, Ser. No. 593
Int. Cl.³ F24J *3/02*; B32B *15/00*
U.S. Cl. 126—417 **8 Claims**



1. In a system for collecting solar radiation comprising an absorber adapted to absorb incident solar radiation and a heating-insulating transparent cover separating said absorber from the ambient atmosphere, said transparent cover comprising (A) a glass substrate oriented such that at least portions of opposite major surfaces thereof are respectively absorber-proximate and absorber-distal respecting said absorber, (B) an infrared-reflecting layer provided on the absorber-proximate surface portion of said substrate, and (C) a solar reflection-reducing layer provided on said infrared-reflecting layer, the improvement comprising:

(I) said infrared-reflecting layer is of semiconductor oxide composition and provided on said absorber-proximate surface portion, said semiconductor oxide having (a) reflectivity of at least 60% in the infrared wavelength range from 5 to 15 microns and (b) less than about 20% absorption throughout a substantial portion of the visible solar wavelength spectrum of 0.3 to 2 microns,

(II) said reflection-reducing layer is a film of a polymeric composition which has a thickness of greater than 0.5 micron and less than 200 micron, and has (a) refractive indices of from about 1.3 to about 1.7 as measured in air at 25° C. to a substantial portion of light in the visible solar spectrum and (b) substantial transparency in the infrared wavelength range from 5 to 15 microns.

2. The system of claim **1**, wherein said absorber has a ratio of absorption to emission of less than 3.

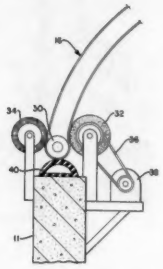
8. In a method for collecting solar radiation wherein an absorber is exposed to said radiation through a heat-insulating light-transmitting cover separating said absorber from the ambient atmosphere, said light-transmitting cover including (a) a glass substrate, (b) an infrared reflection layer provided on at least a portion of one major surface of said substrate, and (c) a reflection reducing layer provided on at least a portion of said infrared reflecting layer, the improvement wherein said cover is the laminar structure of claim **2**, said structure being so oriented that the exposed surface of said glass substrate is distal respecting said absorber and said reflection-reducing layer is proximate said absorber such that said glass substrate generally faces the solar radiation to which the laminar structure is exposed and the reflection-reducing layer faces said absorber spaced from the laminar structure.

4,273,099

SOLAR HEATED BUILDING

Burton D. Morgan, Hudson, Ohio, assignor to Concept Development Institute, Inc., Hudson, Ohio

Filed Jun. 14, 1979, Ser. No. 48,549
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—426 **6 Claims**



1. A solar heated building including roof means comprising a flexible transparent tube of plastic sheeting enclosing the top of the building, rotating means engaging the exterior of said tube to move it around its periphery in endless belt fashion, said tube having a light reflective area and a light transmitting area each extending substantially the length of said tube and being alternately presentable to have the sun's rays reflected therefrom or transmitted therethrough, respectively, said tube of plastic sheeting having a gas sealed therein, and means engaging and operatively sealing the end portions of said tube.

4,273,100

PASSIVE SOLAR HEATING AND COOLING PANELS

Joseph A. Cogliano, Baltimore, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Feb. 16, 1979, Ser. No. 12,733
Int. Cl.³ F24J *3/02*; F28D *15/00*
U.S. Cl. 126—433 **30 Claims**

1. An apparatus to provide a heat exchange relationship across a generally vertical wall defining the inside and outside of a building, said wall having means for mounting a heat pipe at its middle portion for rotational motion of said heat pipe in said wall about said middle portion, said apparatus comprising

a heat pipe having a middle portion passing through the wall with two closed ends, said ends being arranged with respect

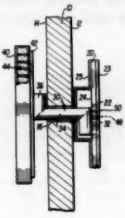
to a middle portion axis extending axially along the length of the middle portion of the heat pipe and

to a plane passing through said axis

so that one closed end extends only perpendicularly above the plane while the other closed end extends perpendicularly to the axis and only below the plane, said heat pipe being mounted in the wall to rotate about the axis of the middle portion of the pipe;

a thermally conductive solar heat panel on the outside of the building and having the side facing the wall in thermal contact with one end portion of the heat pipe; and

a thermally conductive heat absorber on the inside of the building and having the side facing the wall in thermal contact with the other end portion of the heat pipe, whereby when the end portion on the outside is extending downward solar heat is transferred to the inside of the building to warm the building, and when the heat pipe is rotated so the end portion on the inside is extending downward, the inside heat is transferred to the outside to cool the building.



22. A controllable heat pipe comprising a sealed tube containing a vaporizable fluid, said tube having a middle portion and two closed end portions with the portions at each end

(a) being arranged with respect

to a middle portion axis extending axially along the length of the middle portion of the heat pipe and

to a plane passing through said axis

so that one closed end extends only perpendicularly above the plane while the other closed end extends perpendicularly to the axis and only below the plane, and

(b) forming a minimum angle between them when viewed along the middle portion as the vertex of at least 90°,

said tube not requiring any wicking material through which the fluid transfers from one end to the other end.

4,273,101

SOLAR ENERGY SYSTEM

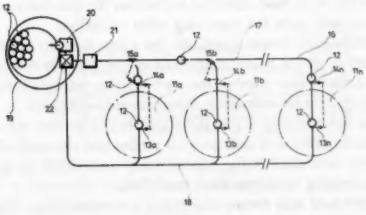
Veit Merges, Putzbrunn, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed May 23, 1979, Ser. No. 41,775

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1978, 2825775

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—435 **26 Claims**



1. A solar energy system comprising: solar radiation focalization means; a plurality of solid solar radiation absorption bodies interacting with said focalization means to effect heating of said absorption bodies by solar radiation through operation of said focalization means; said focalization means comprising a plurality of solar radiation concentrators defining focal points which constitute irradiation positions at which said absorption bodies may be located to absorb solar radiation; heat accumulator means receiving heated absorption bodies from said focalization means and withdrawing heat from said absorption bodies thus received; feed and return means for transporting said absorption bodies between said accumulator means and said focalization means; and means for delivering said absorption bodies individually to said irradiation positions at said radiation concentrators and for maintaining said bodies in position to receive concentrated solar energy from said concentrators until said bodies have reached a desired temperature.

4,273,102

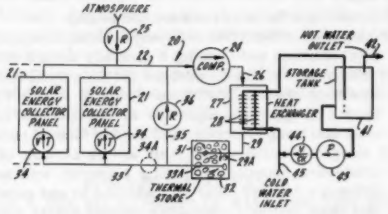
SOLAR ENERGY SYSTEM

Myron L. Anthony, 607 Agana Dr., Grand Junction, Colo. 81501

Filed May 29, 1979, Ser. No. 43,232

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—435 **17 Claims**



1. A solar energy system utilizing high pressure high velocity air as the primary heat transfer medium, comprising:

collector means for collection of radiant solar energy, comprising at least one solar energy collector panel having an air inlet and an air outlet;

an air compressor having an air inlet and an air outlet;

energy utilization means, including an air/fluid heat exchanger having a heating air inlet, a cooled air outlet, a secondary fluid inlet and a secondary fluid outlet;

a series of ducts, forming a closed loop, connecting the collector panel air outlet to the compressor air inlet, the compressor air outlet to the heat exchanger heating air inlet, and the heat exchanger cooled air outlet to the collector panel air inlet;

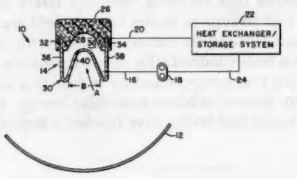
thermal flow control means, comprising a self actuating temperature responsive air flow control valve interposed in the loop in association with the collector means, for limiting the air flow through the collector means to a minimum whenever the air temperature in the collector means is below a minimum threshold and for increasing the air flow through the collector means as the air temperature in the collector means rises above the minimum threshold, up to a maximum flow whenever the air temperature in the collector means exceeds a given maximum threshold, thereby maintaining the temperature of the air output from the collector means within a limited range for a wide variety of solar radiation conditions;

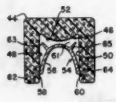
and air feedback means for maintaining a relatively constant air flow through the compressor, the air feedback means comprising an air feedback conduit effectively interconnecting the compressor air outlet back to its inlet, bypassing the collector means, the air feedback means further comprising a self-actuating pressure-responsive feedback control valve interposed in the air feedback conduit.

4,273,103
SOLAR ENERGY RECEIVERS

Miroslav Uroshevich, Cincinnati, Ohio, assignor to Alpha Solarco Inc., Cincinnati, Ohio

Filed Jun. 25, 1979, Ser. No. 52,086
Int. Cl.[3] F24J 3/02; F28F 1/20
U.S. Cl. 126—438 3 Claims



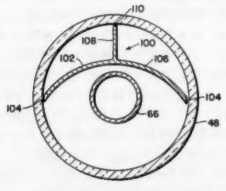


1. A collector for solar radiation comprising:
an elongated reflector for receiving the beam component of solar radiation and focusing it generally along a band;
an elongated element of nitrogen blown polysulfone heat insulating material having an elongated trough formed therein by opposed straight side walls joined by a convex wall, said trough receiving said band of focused radiation;
an elongated extruded thin wall section element of heat conductive material comprising a curved wall section defining a concave outer wall adjacent to and parallel to said band, said heat conductive element having marginal edges with integral flanges embedded in said insulating element to form a passage for heat transfer fluid therebetween, said heat conductive element having an outer surface for directly receiving the focused solar radiation, said outer surface having portions that are normal to the rays of focused solar radiation within said band to maximize solar energy absorption,
said heat conductive element having a pair of elongated integral fins formed along the inner surface thereof, the edges of said fins being positioned closely adjacent the junction between the side walls and said convex wall in said trough for maximizing the surface area of said heat conductive element is exposed to heat transfer fluid;
whereby heat transfer to said fluid is maximized.

4,273,104
SOLAR ENERGY COLLECTORS

Miroslav Uroshevich, Cincinnati, Ohio, assignor to Alpha Solarco Inc., Cincinnati, Ohio

Filed Jun. 25, 1979, Ser. No. 52,088
Int. Cl.[3] F24J 3/02
U.S. Cl. 126—439 6 Claims

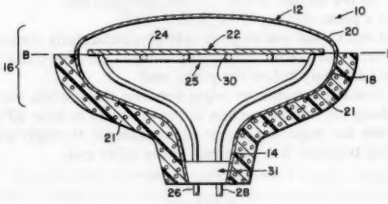


1. A solar energy collector comprising:
means for forming an elongated main reflective concave surface for reflecting and focusing the beam component of solar radiation along a focal line;
an elongated tube like heat conductive receiver positioned coaxially with respect to said focal line, said receiver providing a passageway for heat exchange fluid;
an elongated generally cylindrical shell transparent to solar radiation surrounding said receiver; and
a secondary reflector positioned within said shell and comprising an elongated curve sheet having a concave secondary reflective surface facing said main reflective surface, said receiver being positioned between said main and secondary reflective surfaces, said curved sheet having side edges abutting the interior walls of said cylindrical shell and a longitudinal integral rib extending from the midpoint of said curved sheet and having a side edge which also abuts the interior wall of said cylindrical shell thereby providing said secondary reflector with a three point support.

4,273,105
SOLAR ENERGY COLLECTOR

Miroslav Uroshevich, Cincinnati, Ohio, assignor to Alpha Solarco Inc., Cincinnati, Ohio

Filed Jun. 25, 1979, Ser. No. 52,082
Int. Cl.[3] F24J 3/02
U.S. Cl. 126—443 6 Claims

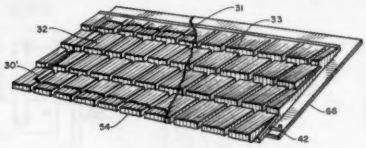


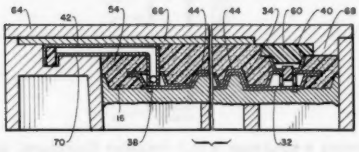
1. A flat plate collector for solar energy, said collector comprising:
a closed shell transparent to solar radiation and comprising a neck portion integrally connected with an expanded generally rectangular portion extending in the direction of a plane normal to the longitudinal axis of said neck portion;
a generally rectangular copper plate positioned in said rectangular portion generally parallel to said plane, said rectangular plate being formed from high conductivity material having a black chrome surface on the side facing away from said neck for receiving solar radiation;
conduit means forming passages for a heat transfer fluid, said conduit means being connected in heat transfer relation to said plate; said conduit means including a single inlet and a single outlet extending through said neck; and
means for forming a gas tight seal between said inlet and outlet portions of said conduit means and the neck of said shell, said shell being substantially evacuated of air for minimizing heat loss from said plate;
wherein said seal means comprises a ceramic plug through which said inlet and outlet of said conduit means extends,
silicone insulating material between said plug and said glass, and a semi-liquid insulating material between the plug and the interior of said glass shell.

4,273,106
COMPOSITE SYNTHETIC ROOFING STRUCTURE WITH INTEGRAL SOLAR COLLECTOR

Walter M. Gould, 1731 Harriman La., Redondo Beach, Calif. 90278

Filed Nov. 16, 1978, Ser. No. 961,328
Int. Cl.[3] F24J 3/02; B29C 23/00; B22D 19/04
U.S. Cl. 126—444 17 Claims





1. A roofing structure incorporating a solar energy collecting device comprising:

a base member;

a form-molded foam shingle structure formed to simulate shingles, securely attached to said base member;

one side and an adjacent end of the shingle structure overlapping an edge of said base member, and the other side and adjacent end of the base member overlapping the either side of the shingle structure;

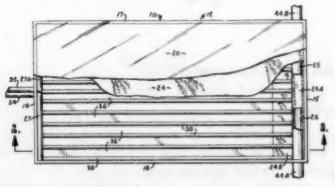
a solar panel having a plurality of interconnected fluid channels embedded in said form-molded foam shingle structure with one surface of the solar panel being contiguous with the surface of the shingle structure; and

said solar panel having an inlet and outlet communicating with said fluid channels at the overlapping edges of the base member and shingle structure whereby adjacently mounted roofing structures conceal the inlet and outlet pipes.

4,273,107
TRACKING SOLAR ENERGY COLLECTOR

James Methvin, Harrisburg, Ark., assignor to Enertek Energy Engineering Inc., Trumann, Ark.

Filed Aug. 20, 1979, Ser. No. 68,171
Int. Cl.[3] F24J 3/02
U.S. Cl. 126—445 2 Claims



1. An internally manifolded tracking solar collector comprising:

rigid, generally rectangular frame means adapted to be coupled to a conventional, external solar tracking device;

substantially planar foam insulative means disposed within said frame means and forming a bottom of said collector;

converter means of substantially planar dimensions formed from carbon silicone sheet material and disposed within said frame means for generating heat from solar energy;

tubular fluid input manifold means disposed interiorly of said collector at one end thereof for inputting heat exchange fluid into said collector;

tubular fluid output manifold means disposed interiorly of said coverter at an opposite end thereof in spaced-apart, substantially parallel relationship with respect to said fluid input manifold means for outputting warmed fluid from said collector to an application;

a plurality of generally parallel elongated, fluid conduction channels disposed within said frame means between said foam insulative means and said converter means for conducting a heat exchange fluid between said input manifold means and said output manifold means, said channels defined between a plurality of rigid, parallel, elongated glue beads extending longitudinally within said frame in perpendicular relation with respect to said input manifold means and said output manifold means, said glue beads operable to secure said converter means and said foam insulative means together;

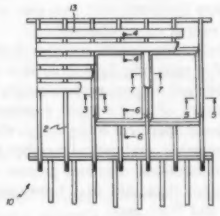
an end portion of said converter means lapped about a major portion of the circumference of said tubular output manifold means whereby to sealably confine fluid within said channels, the terminal edge of said end portion being secured by said glue beads to said bottom foam insulative means; and,

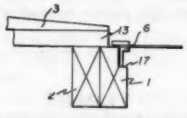
glazing means forming a top of said collector disposed upon said frame above said converter means for minimizing escape of energy.

4,273,108
BUILT-IN SOLAR PANEL

Michael J. Aloi, 835 W. Harvey La. #150, Lodi, Calif. 95240, and Kevin J. Hancock, II, 3525 W. Ben Hoct #289, Stockton, Calif. 95209

Filed Dec. 11, 1979, Ser. No. 102,616
Int. Cl.[3] F24J 3/02; E04B 7/18; F28F 9/04
U.S. Cl. 126—450 5 Claims





1. A solar panel formed to be set in the roof of a building having downwardly extending rafters and transverse roof sheeting comprising in combination:

a solar panel frame set within cutaway portions of the rafters and sheeting and fastened thereto,

a pair of conduit means horizontally disposed within said frame in which one of said conduit means is at a higher elevation than the other,

plural substantially linear tubed collector plate means interconnecting said conduit means,

a step portion disposed on an upper inner periphery of said frame,

a frame lower portion set on said step portion having an inverted substantially "L" shaped cross sections,

a frame upper portion overlying and fastened to said frame lower portion,

and a transparent panel secured between said upper and lower frame portions whereby solar radiation passing through said panel heats liquid within said tubes.

4,273,109

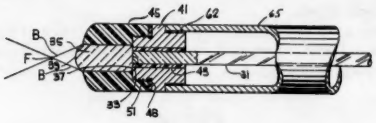
FIBER OPTIC LIGHT DELIVERY APPARATUS AND MEDICAL INSTRUMENT UTILIZING SAME

Charles E. Enderby, Palo Alto, Calif., assignor to Cavitron Corporation, New York, N.Y.

Continuation of Ser. No. 702,596, Jul. 6, 1976, abandoned, which is a continuation-in-part of Ser. No. 636,139, Nov. 28, 1975, abandoned. This application Jun. 16, 1978, Ser. No. 916,383

Int. Cl.[3] **A61N** *5/06;* **A61B** *17/32*

U.S. Cl. 128—6 **12 Claims**



1. In a light energy delivery apparatus having an elongated fiber optic fiber having along its length a first transverse crossectional diameter, an entrance aperture at a first end of said fiber and an exit aperture at a second end of said fiber opposite said entrance aperture, a high energy light source mounted adjacent said entrance aperture such that when energized said light source directs light into said first end of said fiber, the improvement of output optics comprising,

an internally reflecting optical member having input aperture means for receiving light from said exit aperture of said optic fiber and output aperture means for discharging light, the length of said optical member between said output and input apertures being longer than the width of said optical member, said optical member having a second transverse crossectional diameter greater substantially all along its length than said first transverse crossectional diameter of said fiber, and

connecting and coupling means for releasably interlocking said input aperture means of said optical member to said exit aperture of said fiber and optically coupling the same in an efficient light energy-transmissive relation.

4,273,110

ULTRAVIOLET ENDOSCOPE

Jean Groux, 15 Av. de Lenine, Morsang sur Orge, France (91390)

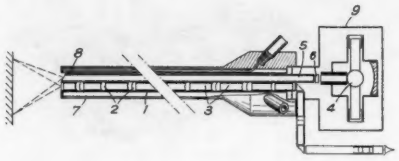
Filed Jul. 11, 1979, Ser. No. 56,703

Claims priority, application France, Jul. 13, 1978, 78 20993

Int. Cl.[3] **A61B** *1/06*

U.S. Cl. 128—6 **9 Claims**

1. An endoscope for examining detailed images from a first inaccessible location to a second viewing location, said endoscope comprising an image transmitting member for transmitting an image from said first location to said second location, light guide means for transmitting light produced by a source of ultraviolet and visible light to said first location, and conduit means substantially coextensive with said light guide means for



delivering a substance which becomes flourescent under the influence of ultraviolet light to said first location.

4,273,111

ENDOSCOPE WITH BEND ANGLE CONTROL

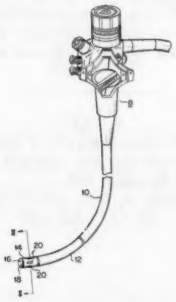
Takashi Tsukaya, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 7, 1979, Ser. No. 101,076

Claims priority, application Japan, Dec. 22, 1978, 53/158869

Int. Cl.[3] **A61B** *1/06;* **A61M** *25/00*

U.S. Cl. 128—6 **4 Claims**



1. An endoscope comprising:

(a) a distal end portion containing an observation optical system;

(b) a flexible tube;

(c) a freely bendable section for connecting the distal end portion to the flexible tube;

(d) a plurality of supersonic transducers spatially arranged on the peripheral wall of the distal end portion; and

(e) bend angle control means for controlling the angle through which the freely bendable section is to be bent in accordance with data supplied from the plural supersonic transducers in order to direct the distal end portion of said freely bendable section to the substantial center of the cross section of a coelinc tube to be examined.

4,273,112

LARYNGOSCOPE

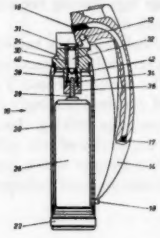
Helmut A. Heine, Herrsching; Helmut W. Rosenbusch, Weilheim, and Rudolf Kratzer, Oberalting, all of Fed. Rep. of Germany, assignors to Propper Manufacturing Co., Inc., Long Island City, N.Y. and Heine Optotechnik GmbH & Co. KG, Herrsching, Fed. Rep. of Germany

Filed Aug. 10, 1978, Ser. No. 932,494

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1977, 2738202

Int. Cl.³ A61D *1/06*

U.S. Cl. 128—11 **12 Claims**



1. A laryngoscope comprising a handle, a lamp mounted within one end of said handle, said lamp being movable between an energized position and a de-energized position, said lamp being electrically connected to power supply terminals within said handle when in said energized position and being disconnected from at least one of said power supply terminals when in said de-energized position, a spatula pivotally mounted on said handle adjacent said lamp, said spatula being movable between a non-operating position and an operating position, means for moving said lamp into said energized position when said spatula is moved to said operating position and for moving said lamp to said de-energized position when said spatula is moved to said non-operating position so as to energize said lamp, light transmissive means associated with said spatula for conducting light from said lamp to the field under observation, and means for supporting said lamp in said handle and movable therewith, said supporting means having a protruding part engageable from outside said one end of said handle, said one end of said handle and said supporting means constructed and arranged so that said supporting means can be removed from said handle in a direction away from said operating position by engagement of said protruding part for replacement of said lamp therein when said spatula is moved from said operating position.

4,273,113

FOOT EXERCISER

Steven R. Hofstein, North Brunswick, N.J., assignor to World Medical Marketing Corporation, New York, N.Y.

Division of Ser. No. 85,330, Oct. 29, 1979. This application Jan. 14, 1980, Ser. No. 111,925

Int. Cl.³ A61H *1/02*

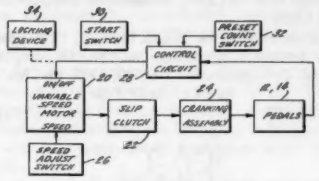
U.S. Cl. 128—25 B **5 Claims**

1. A foot exercising device, comprising:

a pair of pedals;

motor means for reciprocating said foot pedals; and

control circuit means for controlling the operation of said motor means, said control circuit means sequentially placing said motor means in a passive and an active mode of operation, said control circuit means switching said motor means from said passive mode to said active mode after it



has detected that said pedals have been reciprocated m times during said passive mode, m being a positive integer.

4,273,114

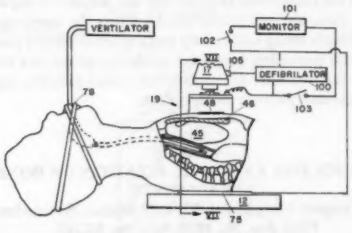
CARDIOPULMONARY RESUSCITATOR, DEFIBRILLATOR AND MONITOR

Clare E. Barkalow, Comstock Park, Mich., and James O. Elam, Chicago, Ill., assignors to Michigan Instruments, Inc., Grand Rapids, Mich.

Continuation-in-part of Ser. No. 952,656, Oct. 19, 1978, Pat. No. 4,198,963. This application Nov. 23, 1979, Ser. No. 96,659

Int. Cl.³ A61N *1/36*

U.S. Cl. 128—53 **29 Claims**



1. A cardiac compressor and defibrillator comprising in combination:

a reciprocatable cardiac compressor means for cyclically compressing a patient's chest;

said compressor means including a base for positioning behind the patient's back posterior to the patient's heart;

said compressor means including a cardiac compressor pad for positioning anterior to the patient's heart, said compressor pad being actuated by said compressor means for compressing the patient's heart between said compressor pad and said base;

an anterior electrode disposed on said compressor pad for compression between said compressor pad and the patient's sternum;

a posterior electrode disposed on said base for compression between said base and the patient's back;

a cardiac defibrillator means connected to said anterior and posterior electrodes for establishing an electric current therebetween; and

a means for synchronizing said defibrillator means and said compressor means whereby a defibrillating current is applied to the patient's heart only during compression of a patient's heart.

4,273,115

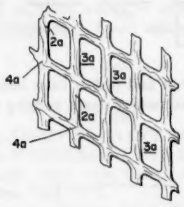
MOLDABLE PLASTIC ORTHOPEDIC CAST

Kenneth M. Holland, Pebble Beach, and Milton F. Custer, Livermore, both of Calif., assignors to Hexcel Corporation, Dublin, Calif.

Continuation of Ser. No. 20,006, Mar. 12, 1979, abandoned, which is a continuation of Ser. No. 633,333, Nov. 19, 1975, abandoned. This application Dec. 10, 1979, Ser. No. 102,285

Int. Cl.[3] **A61F** *5/04*

U.S. Cl. 128—90 **13 Claims**



1. A bandage material for forming in place an orthopedic cast, comprising a pliant, large mesh fabric carrier formed from a knit having bulky strands of high structural stability and low density, each strand being formed from a plurality of fibers, said strands being porous and of relatively bulky and high heat insulating material, the fabric carrier having openings of relatively large transverse dimension, the strands having a raw diameter of between 0.013 and 0.040 inches, each strand being coated and only partially impregnated with a polymer composition having a heat softening point of not less than 125° F. and not greater than 165° F., said polymer coated strands defining openings having an area of not less than 0.020 square inches and not greater than about 0.25 square inches, whereby said openings are sufficiently large so that the polymer composition does not form air impervious blocks across the openings, said coated strands being sufficiently large so as to have a plurality of air voids providing increased insulating properties for said bandage material after the strands have been partially impregnated with said polymer composition.

4,273,116

DEVICE FOR EXTERNAL FIXATION OF BONE FRAGMENTS

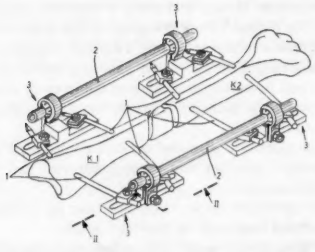
Claude Chiquet, Morystrasse 77, 4125 Riehen, Switzerland

Filed Jun. 26, 1979, Ser. No. 52,247

Claims priority, application Switzerland, Jun. 27, 1978, 7007/78

Int. Cl.[3] **A61F** *5/04;* **F16** *3/00;* **F16C** *11/06;* **F16D** *1/12*

U.S. Cl. 128—92 A **3 Claims**



1. A device for the reduction of bone fractures, of the type having pins intended to be inserted in groups into portions of bone to be mutually fixed or realigned, said pins being connected by sliding universal articulated couplings to at least one rigid tie-rod, said device comprising a plurality of said couplings, each coupling including

a T-shaped member having two arms exhibiting respective longitudinal slots,

two nut-and-bolt assemblies respectively disposed in said slots,

clamping means cooperating with each of said nut-and-bolt assemblies for adjustably clamping and unclamping end portions of said pins to said two arms,

a spherical adapter sleeve split by staggered slots and slidingly mounted on said tie-rod,

a coupling locking clamp comprising a ring portion having a spherical-shaped inner clamping surface embracing and fitted to said adapter sleeve and two straight end portions to which clamp lugs having respective screw holes are integrally affixed, and

a further nut-and-bolt assembly traversing said clamp lugs through said screw holes for securing said coupling locking clamp to the upright of said T-shaped member and, when tightened, for simultaneously preventing both swivelling of said coupling locking clamp and said T-shaped member about the center of said spherical adapter sleeve and sliding of said adapter sleeve, together with said coupling locking clamp and said T-shaped member, along said tie-rod.

4,273,117

APPARATUS FOR DRILLING BONE

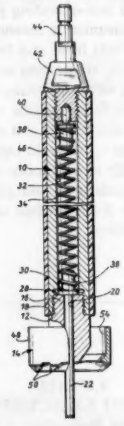
Hans G. Neuhäuser, Moorhaldenstrasse 22,, 7130 Mühlacker, Fed. Rep. of Germany

Filed Aug. 24, 1979, Ser. No. 69,625

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1978, 2838348

Int. Cl.[3] **A61F** *5/04, 17/32;* **A61B** *17/16;* **B23B** *51/00*

U.S. Cl. 128—92 E **20 Claims**



1. Apparatus suitable for forming a hole in bone, which comprises a body comprising a manually gripable outer casing, an inner shaft rotatably arranged within the casing, a drill bit attached to the lower end of the inner shaft for rotation therewith, and a mandrel coaxial and rotatable with respect to the drill bit, said mandrel being slidably projectable through said drill bit between a retracted and an extended position, means biasing said mandrel to an extended position and teeth on said mandrel for abutting the bone to prevent rotation of the mandrel relative to the bone.

4,273,118

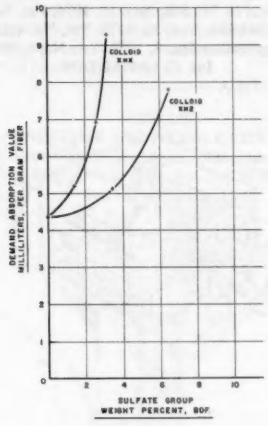
FIBERS OF HIGH FLUID HOLDING CAPACITY

Frederick R. Smith, Toms Brook, Va., assignor to Avtex Fibers Inc., Valley Forge, Pa.

Filed Jun. 4, 1979, Ser. No. 45,146

Int. Cl.³ A61L *15/00*

U.S. Cl. 128—156 **15 Claims**



1. An article of manufacture comprising a highly fluid absorbent mass of alloy fibers, said fibers comprising a matrix of regenerated cellulose and a cellulose sulfate salt of an alkali-metal dispersed therein, said salt being present in an amount of at least about five weight percent based on the weight of the cellulose.

4,273,119

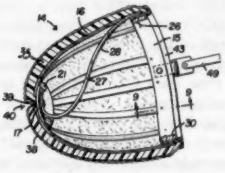
BREATHING MASK FOR HORSES

John L. Marchello, 57751 Grand River Ave., New Hudson, Mich. 48165

Filed Feb. 26, 1980, Ser. No. 124,801

Int. Cl.³ A61M *15/00;* **A62B** *23/06;* **B68B** *5/00*

U.S. Cl. 128—201.13 **6 Claims**



1. A bag-like mask for fitting over and receiving the forward, i.e., nose and mouth, portion of a horse's head, comprising:

an approximately dome-like shaped frame having a rear open end formed of a ring-like base member through which the forward end of the horse's head is inserted, and having frame members extending forwardly from the base member and joined together to form the closed forward end of the frame, with the frame members being spaced a distance outwardly from the adjacent head portions;

a cover shaped to correspond to the frame shape, and being fitted over and secured to the frame; said cover being formed of a relatively thick wall, flexible, open cell, foamed plastic material,

releasable fastening means for securing the mask upon a horse's head for wearing during exercising, as well as when the horse is stationary;

a nose engaging bar arranged within the frame and comprising an elongated, flat, semi-flexible, relatively stiff strip having one end secured to the base member, and its opposite end secured to the frame at the closed forward end thereof, with the bar being bent in between its ends for resting upon the upper surface of the horse's head, at the nose portion, and between the horse's nostrils for thereby positioning and holding the frame upon the horse's head, but with the frame spaced a distance from the horse's nostrils;

an absorbent pad arranged within the mask between the nose bar and the closed forward end of the frame for absorbing and emitting inhalants applied to the pad;

the cover material cell size being sufficiently air pervious to substantially freely pass air therethrough, but to screen a substantial portion of dust and the like carried by the air, and the cover wall being of sufficient thickness to tend to produce a cold weather breathing cycle wherein a part of the moisture in exhaled breath condenses in the wall portion near the inner surface of the cover so that the condensation tends to insulate and help retain some heat within the mask, and wherein fresh air inhaled passes through such condensation and retained heat and tends to pick up some moisture and become somewhat preheated before inhalation thereof.

4,273,120

UNDERWATER BREATHING APPARATUS

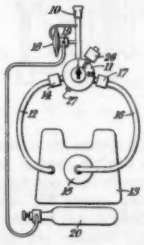
Hugh H. B. Oswell, Hexham, England, assignor to Submarine Products Limited, Northumberland, England

Filed Feb. 27, 1979, Ser. No. 15,741

Claims priority, application United Kingdom, Feb. 27, 1978, 7728/78

Int. Cl.³ A62B *7/00*

U.S. Cl. 128—204.26 **13 Claims**



1. A closed circuit breathing apparatus for use by an individual comprising:

a mouthpiece operatively connected to an outward flow conduit and return flow conduit, said outward and return flow conduits being operatively connected to an inflatable breathing bag;

a control valve operatively connected to said mouthpiece;

a gas flow path between said mouthpiece and the control valve;

absorbent means for removing carbon dioxide being operatively connected between said outward and return flow conduits and disposed substantially within said inflatable breathing bag;

a breathing circuit being formed on exhalation between said outward flow conduit and said inflatable breathing bag and on inhalation between said inflatable breathing bag and said return flow conduit, said absorbent means being operatively positioned within said breathing circuit for removing carbon dioxide from exhaled gases;

a one-way exhaust valve operatively connected to said control valve;

said control valve being operatively connected to the said outward and return flow conduits and to said gas flow path, said control valve including a valve member movable between a first position in which the control valve connects the mouthpiece to the outward and return flow conduits to allow closed circuit breathing and a second position in which the control valve disconnects the mouthpiece from the outward and return flow conduits and connects the mouthpiece to said one-way exhaust valve to allow gas to be exhaled through the exhaust vlave;

a supply of breathable gas;

an inlet flow conduit operatively connected to said supply of breathable gas;

a connection between said inlet flow conduit and said gas flow path; and

a demand valve in said connection for controlling the flow of breathable gas from the inlet flow conduit to the mouthpiece.

4,273,121

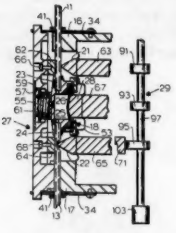
MEDICAL INFUSION SYSTEM

Jal S. Jassawalla, San Francisco, Calif., assignor to Andros Incorporated, Berkeley, Calif.

Continuation-in-part of Ser. No. 878,700, Feb. 17, 1978, Pat. No. 4,199,307, which is a continuation-in-part of Ser. No. 812,904, Jul. 5, 1977, abandoned. This application Sep. 28, 1979, Ser. No. 79,806

Int. Cl.[3] A61M *5/00*

U.S. Cl. 128—214 F **5 Claims**



1. A medical infusion system for pumping fluids or semi-solids from an upstream flexible conduit portion of the infusion system to a downstream flexible conduit portion thereof, comprising, a pump having means for supporting said conduit portions, first constricting means for selectively restricting and opening said upstream conduit portion, second restricting means for selectively restricting and opening said downstream conduit portion, a cassette having means for connecting to said upstream and downstream conduit portions, said cassette comprising a rigid enclosure defining a substantially cylindrical pumping cavity having an open end defining a window and having valveless inlet and outlet openings, the cross-sectional area of each of said inlet and outlet openings having a ratio to the area of said window not greater than about 0.3 to 1, a diaphragm relatively more flexible than said enclosure extending and held in fluid tight engagement across said window and being impermeable to the passage of fluids or semi-solids therethrough, means for releasably supporting said cassette in a position between said upstream and downstream conduit portions in connection therewith, actuator means for engaging said diaphragm and being movable to displace, from a fully retracted position to a fully extended position, a predetermined volume in said pumping cavity, said actuator means being of a size such that the area of said diaphragm not engaged with said actuator means is less than about three-quarters of the total area of said diaphragm, said predetermined volume being at least about 0.25 ml and less than about 1.01 ml, and means for operating said first and second restricting means and said actuator means in a sequence such as to pump fluids or semi-solids from said upstream conduit portion to said downstream conduit portion.

4,273,122

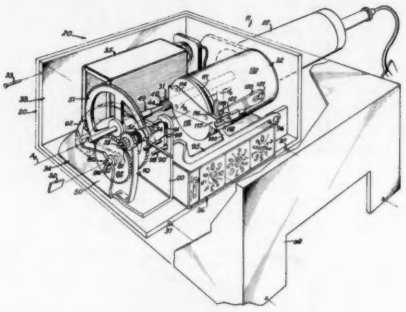
SELF CONTAINED POWERED INJECTION SYSTEM

Douglass G. Whitney, 2518 W. Wesley Rd., and John K. Martin, III, 2837 Ridge Wood Cir., both of Atlanta, Ga. 30327

Division of Ser. No. 741,528, Nov. 12, 1976, Pat. No. 4,150,672, and Ser. No. 964,953, Nov. 30, 1978, Pat. No. 4,235,234. This application Jan. 8, 1979, Ser. No. 1,091

Int. Cl.[3] A61M *5/00*

U.S. Cl. 128—218 A **18 Claims**



1. Apparatus for injecting fluid into a patient at an average prescribed rate over a prolonged period of time comprising:

carriage means defining a fluid chamber therein carrying fluid to be dispensed and an outlet from said fluid chamber connected to the patient;

a piston slidably mounted in said fluid chamber for forcing fluid from said outlet as said piston is moved toward said outlet;

an electrical power supply;

electrically operated driving means for moving said piston toward said outlet when said electrically operated driving means is connected to said power supply, said electrically operated driving means constructed and arranged to move said piston only a prescribed distance toward said outlet each time said electrical power supply is connected to said electrically operated driving means regardless of the length of time said electrical power supply is connected to said electrically operated driving means, said piston forcing a volume of the fluid from said outlet much less than the total volume of fluid to be injected over the prolonged period of time each time said piston is moved said prescribed distance; and,

control means for selectively connecting said electrical power supply to and disconnecting said electrical power supply from said electrically operated driving means at a rate such that fluid is injected into the patient at the desired average rate over the prolonged period of time so that, if said control means fails so as to continuously connect said electrical power supply to said electrically operated driving means, said piston will be moved only said incremental prescribed distance toward said outlet to prevent overdosing the patient, said control means including:

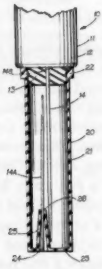
switching means for selectively connecting said electrical power supply to said electrically operated driving means;

timing pulse generator means for operating said switching means; and

programming means for selectively controlling the timing pulse rate output of said timing pulse generator, said programming means including encoding means; manually operated input means for selectively encoding said encod-

ing means with the volume of fluid to be injected over a selected time period; manually adjustable time period selector means for selecting the time period over which the fluid is to be injected; and dosage rate logic means operatively connected to said encoding means, said time period selector means, and said timing pulse generator for calculating the required timing pulse output from said timing pulse generator to cause the volume of fluid encoded into said encoding means to be injected within the time period selected in said time period selector means and for causing said timing pulse generator to generate the required timing pulse output.

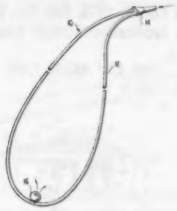
4,273,123
SYRINGE AND NEEDLE COVER
Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840
Filed Oct. 1, 1979, Ser. No. 80,561
Int. Cl.³ A61M *5/00*
U.S. Cl. 128—218 N **6 Claims**



1. A disposable hypodermic syringe comprising in combination:
- a tubular housing which is open at one end and closed at the other,
- a hypodermic needle secured to the closed end of said housing,
- a piston slidably movable within the interior of said tubular housing for forcing a liquid therefrom through said hypodermic needle,
- a protective plastic closure of elongated tubular shape open at one end and closed at the other,
- said closure adapted to surround said hypodermic needle and to be frictionally engaged within the end of the tubular housing supporting said needle to provide protection for said needle during storage of the syringe,
- said closure having a thin wall portion containing a tubular extension thereof defining a passageway for receiving said needle, and
- a penetrable wall extending across said tubular extension through which penetrable wall said needle may be passed after penetrating same so as to permit said needle to be frictionally held within said tubular extension and to be retained therein after the syringe and needle have been used.

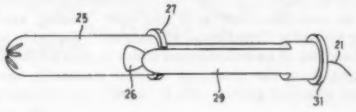
4,273,124
NASAL CANNULA
J. Earl Zimmerman, Rte. 3, Box 351, Pine Grove, Pa. 17963
Filed Jun. 1, 1979, Ser. No. 44,582
Int. Cl.³ A61M *3/00*
U.S. Cl. 128—245 **13 Claims**

1. A breathing apparatus comprising a source of pressurized therapeutic gas, a nasal cannula directly connected to said gas source and positioned within the nose of a patient to administer the gas to the patient, said cannula comprising a resilient enlarged member configured to fit snugly against the vestibule wall of one nasal cavity of the patient to form a tight seal with respect thereto while maintaining the other nasal cavity in communication with ambient surroundings, said enlarged member including a passage therethrough for communicating the gas with the nasal cavity so that the gas supplied from said



source is inhaled solely through said one nasal cavity and into the patient's lungs and exhaled solely through said other nasal cavity and/or open mouth of the patient.

4,273,125
TAMPON
Akira Sakurai, Utsunomiya, Japan, assignor to Kao Soap Co., Ltd., Tokyo, Japan
Filed Mar. 20, 1980, Ser. No. 132,249
Claims priority, application Japan, Apr. 12, 1979, 54-44582
Int. Cl.³ A61F *15/00*
U.S. Cl. 128—263 **7 Claims**



1. A tampon, comprising:
- an elongated outer cylinder having an outer end and having an inner end adapted for insertion into a vagina, a mass of absorbent material disposed inside said outer cylinder close to the inner end thereof and adapted to be moved through said inner end of said outer cylinder, said outer cylinder having one or more through holes formed in the side wall thereof at a location spaced from the inner end of said outer cylinder and in the region of the outer end of said mass of absorbent material;
- a push-out member mounted on said outer cylinder for sliding movement in a direction lengthwise thereof, said push-out member having one or more longitudinally extending push-out pieces corresponding in number to the number of said holes, said push-out pieces being disposed outside of said outer cylinder, said push-out pieces having a size such that they can be extended through said holes into the interior of said outer cylinder for engaging said mass of absorbent material in response to movement of said push-out member relative to said outer cylinder and then longitudinal movement of said push-out member in a direction toward the inner end of said outer cylinder causes said push-out pieces to move said mass of absorbent material out of said outer cylinder through the inner end thereof.

4,273,126

ATTACHMENT DEVICE FOR TRACHEAL ASPIRATOR

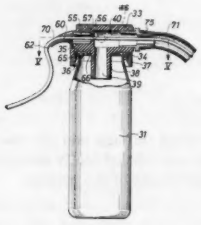
Christian Grane, Kokkedal, and Ole B. Kohnke, Kgd. Lyngby, both of Denmark, assignors to Ruth Lea Hesse, Rungsted Kyst, Denmark

Filed Feb. 7, 1978, Ser. No. 875,804

Claims priority, application United Kingdom, Feb. 8, 1977, 5218/77

Int. Cl.³ A61M *1/00*

U.S. Cl. 128—276 **12 Claims**



1. Attachment device for use in combination with a pump operating as a tracheal aspirator, for sucking and collecting secretion from the oral cavity of an unconscious person and separating large solid particles from the aspired air and from any such liquid secretion as flows to the normal secretion reservoir of the pump, comprising: a hand-held container with rigid walls having a secretion inlet opening with an inside diameter of between 6 and 12 millimeters, said diameter being sufficiently large to permit passage of solid particles normally occurring in secretion such as vomitus; and a secretion suction tube of correspondingly large inside diameter and of a length in the range between 200 and 300 millimeters, said length being just sufficient to enable the device to be operated in front of the mouth of a patient, one end of said tube being received by said inlet opening, said container having an outlet opening provided with means for connecting said device to the suction tube of the pump, a passage being provided substantially in line and in communication with said inlet opening, said passage being normally closed by a lock member adapted to be opened for insertion of an introduction stylus to pass through the inlet opening from the inner end thereof outwardly into the attached secretion suction tube to support said secretion suction tube.

4,273,127

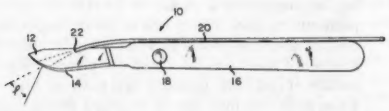
METHOD FOR CUTTING AND COAGULATING TISSUE

David C. Auth, Bellevue, and Robert F. Rushmer, Seattle, both of Wash., assignors to Research Corporation, New York, N.Y.

Continuation of Ser. No. 950,694, Oct. 12, 1978, abandoned, which is a continuation-in-part of Ser. No. 656,709, Feb. 9, 1976, Pat. No. 4,126,136. This application Aug. 4, 1980, Ser. No. 175,322

Int. Cl.³ A61B *17/36*

U.S. Cl. 128—303.1 **6 Claims**



1. A method of creating an incision in vascularized tissue and coagulating tissue adjacent the incision comprising coupling laser radiation to a light guide having a relatively narrow working surface which is elongated in the direction of the incision from which said radiation is emitted in a beam and which has a relatively large angle of divergence in a plane perpendicular to said incision, and guiding said working surface along and in contact with said tissue, said laser radiation being of sufficient intensity to form said incision so that said laser radiation forms said incision at the point of contact between said working surface and tissue and coagulates blood adjacent said incision while the contact between said working surface and tissue provides tactile feedback and facilitates coupling of laser radiation from said light guide to said tissue.

4,273,128

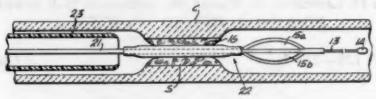
CORONARY CUTTING AND DILATING INSTRUMENT

Banning G. Lary, 6225 SW. 117th Ter., Miami, Fla. 33156

Filed Jan. 14, 1980, Ser. No. 111,807

Int. Cl.³ A61B *17/32*; A61M *29/02*

U.S. Cl. 128—305 **6 Claims**



1. A coronary dilating and cutting instrument comprising, in combination, a cannula, flexible probe means extending outwardly of one end of said cannula for the guidance thereof through an artery, cutting means extending laterally outwardly of said cannula for longitudinally cutting a stenonic arterial zone as said cannula is introduced centrally through the artery, said cutting means being located behind said flexible probe means and comprising a flat knife blade defining a radially-extending plane with respect to said cannula, said knife blade having a cutting edge of arcuate shape, an elongated, tubular, inflatable balloon circumjacent said cannula directly behind said cutting means and having end portions thereof circumferentially secured and hermetically sealed with respect to spaced, outer surface portions of said cannula, through opening means in said cannula side wall and in registration with said balloon for the introduction of hydraulic fluid into said balloon through the other end of said cannula, and means at the other end of said cannula for connection with a source of hydraulic fluid under pressure for the controlled inflation of said balloon.

4,273,129

FORCEPS FOR APPLYING CLIPS TO FALLOPIAN TUBES

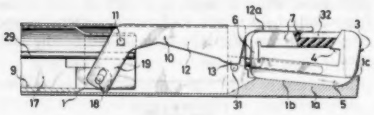
Manfred Boebel, Oetisheim, Fed. Rep. of Germany, assignor to Richard Wolf GmbH, Knittlengen, Fed. Rep. of Germany

Filed Jun. 20, 1979, Ser. No. 50,454

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1978, 2828564; Dec. 27, 1978, 2856241

Int. Cl.³ A61B *17/12*

U.S. Cl. 128—326 **11 Claims**



1. Forceps for applying a clip to a fallopian tube, said clip being in one piece and made of plastics material and having two separable arms connected by a flexible strip, one of said arms having a latch recess in a free end thereof facing said strip, into which recess the end of the other one of said clip arms is pressable by elastic deformation, said forceps having an outer shaft provided with a cutout to receive the clip in open condition with the other clip arm extended, said forceps comprising two proximal handle members for relative opening and closing movement, a two-armed closing lever mounted for opening and closing movement on a pivot bearing carried by a

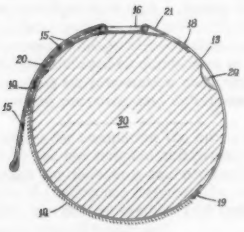
movable inner shaft inside said outer shaft, one arm of said lever when closed having a face parallel with said outer shaft to lie adjacent said other clip arm when the clip is closed, the one lever arm also having a projection engageable with the other clip arm when in the open condition to press it into said latch recess to latch the clip and the other lever arm being pivotally connected to a lever-operating rod movable axially inside said outer shaft both in the distal and proximal direction upon movement of said proximal handle members, and means to advance said inner shaft and pivot bearing distally with said rod after the latter has first been moved distally a predetermined distance, whereby said rod upon movement of said handle members first is distally movable through said predetermined distance to open said closing lever and then is distally movable farther to simultaneously advance said inner shaft and said pivot bearing distally so that said projection of said closing lever is aligned against said other clip arm and so that, by leaving the closing lever in said aligned position said rod may be retracted proximally to cause said lever to close the clip.

4,273,130

CONSTRICTOR

Judith V. Simpson, 307 MacLaren La., Lake Bluff, Ill. 60044

Filed Dec. 11, 1978, Ser. No. 968,173
Int. Cl.³ A61B *17/12*
U.S. Cl. 128—327 **10 Claims**



1. A constrictor for medical use comprising; an elongated flexible strip having a ring affixed to one end and an end tab at the other end, said strip consisting of an elastic portion, a first coupling surface portion and a second coupling surface portion on the same face of the strip, said first and second coupling surfaces cooperating upon contact to provide resistance to slidable motion between said surfaces and providing disengagement by separation of the surfaces, said elastic portion being about 6 to 17 percent, said first coupling surface portion about 17 to 28 percent, and said second coupling surface portion about 55 to 77 percent of the length of said elongated flexible strip, said strip being of a length that it will encompass a limb or trunk of a patient, pass through said ring and reverse upon itself such that said first and second coupling surface portions will attach to each other, said constrictor being capable of application and adjustment using one hand by passing said end tab through said ring and pulling said second coupling surface portion back over itself to engage said first coupling surface portion.

4,273,131

SURGICAL STYLET

C. Eric Olsen, Oxnard, Calif., assignor to Auburn Enterprises, Inc., Ventura, Calif.

Filed Jun. 18, 1979, Ser. No. 49,949
Int. Cl.³ A61M *29/00*
U.S. Cl. 128—341 **5 Claims**

1. A surgical stylet comprising:

an elongated member formed of a core and a first exterior covering, said core being of a solid metal but bendable into a variety of different configurations, said core having a longitudinal center axis, said first exterior covering comprising a rigid plastic;

said elongated member having a fore end and an aft end, said core extending into said fore end, said core having a tip, said tip being smoothly contoured, a second exterior covering extending beyond said tip, said second exterior

covering being formed of a resilient cushiony plastic so as to deter the making of puncture wounds in tissue during use of the stylet; and

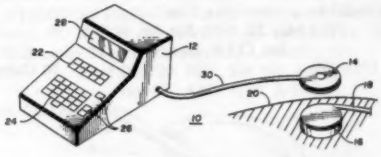
said first exterior covering being extruded upon said core, said core being of uniform cross-sectional configuration, said exterior covering being of uniform cross-sectional configuration.

4,273,132

DIGITAL CARDIAC PACEMAKER WITH THRESHOLD MARGIN CHECK

Jerome T. Hartlaub, New Brighton; David L. Thompson, Fridley, and Ray S. McDonald, St. Paul, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Nov. 6, 1978, Ser. No. 958,090
Int. Cl.³ A61N *1/36*
U.S. Cl. 128—419 PT **21 Claims**

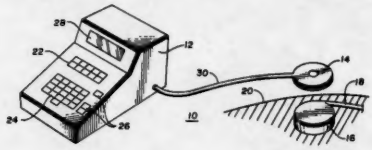


1. An implantable cardiac pacemaker pulse generator having stimulating signal providing means for generating electrical stimulating pulses having a defined pulse energy and rate adapted to be applied to stimulate the heart, and detecting means for receiving a test signal from an external source and providing a threshold safety margin signal, further comprising safety margin means responsive to said threshold safety margin signal for causing said stimulating signal providing means to provide a test series of stimulating pulses at a rate different than the defined rate when said defined rate is lower than said test rate and at said defined rate where said defined rate exceeds said test rate and to provide one of said stimulating signal having a pulse energy reduced by a predetermined amount from the defined pulse energy, and means for terminating said test series when fixed number of said stimulating pulses is produced following the provision of said threshold safety margin signal.

4,273,133
PROGRAMMABLE DIGITAL CARDIAC PACEMAKER WITH MEANS TO OVERRIDE EFFECTS OF REED SWITCH CLOSURE

Jerome T. Hartlaub, New Brighton; Ray S. McDonald, St. Paul, and Martin A. Rossing, Anoka, all of Minn., assignors to Medtronic. Inc., Minneapolis, Minn.

Filed Nov. 6, 1978, Ser. No. 958,325
Int. Cl.[3] A61N 1/36
U.S. Cl. 128—419 PG 19 Claims



1. The programmable medical device having operating modes or parameters adapted to be programmed by the application thereto of first and second programming signals which include the program data manifesting the desired operating mode or parameter values for the medical device to assume, comprising:

means responsive to the first programming signal for receiving and storing the second programming signal;

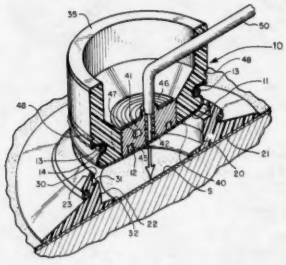
switching means responsive to the first programming signal for switching the operating mode of the medical device from a normal operating mode to a different operating mode; and

disabling means responsive to the program data manifesting certain parameters for disabling said switching means so that the medical device is maintained in its normal operating mode while the medical device is programmed to the certain parameter value.

4,273,134
FIXATION RING ASSEMBLY AND METHOD OF ASSEMBLING A SENSOR HEAD

Robert H. Ricciardelli, Waukesha, Wis., assignor to Biochem International Inc., Wauwatosa, Wis.

Filed May 22, 1979, Ser. No. 41,524
Int. Cl.[3] A61B 5/00
U.S. Cl. 128—635 10 Claims



1. A method of assembling a sensor head and permeable membrane encapsulating electrolyte over the electrode surface of the sensor head, for securing to the surface of a patient's skin by means of a fixation ring, wherein the fixation ring has an annular passage extending therethrough from an upper face to a lower face, comprising the steps of:

a. fastening a sheet of permeable membrane film across the upper face of the fixation ring covering one end of said passage,

b. placing an electrolyte on at least one of the electrode surface and the membrane film over the passage,

c. inserting the sensor head into said passage through said one end whereby the membrane is pressed against the base of the sensor head with the electrolyte over the electrode surface, and

d. causing said membrane to be released from said fixation ring and fastened to said sensor head when said sensor head is inserted.

5. A fixation ring for securing to the surface of a patient's skin, comprising:

a. a member having a lower face for seating on the skin surface of a patient, and an upper face opposite said lower face,

b. said member having an annular passage in it opening through both said upper and lower faces,

c. said passage including a first, largest diameter passage section adjacent said upper face, a second smaller diameter passage section intermediate said faces, and a third, smallest diameter passage section adjacent said lower face,

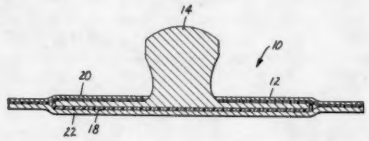
d. sensor body detent means formed inwardly of said first passage section adjacent said upper face, and

e. an annular resilient ring seating channel with opposed shoulders encircling the outside of said member around said passage.

4,273,135
BIOMEDICAL ELECTRODE

Franklin C. Larimore, Shoreview, and Steven M. Heilmann, North St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 825,870, Aug. 19, 1977, abandoned. This application Sep. 8, 1978, Ser. No. 940,735
Int. Cl.[3] A61B 5/04
U.S. Cl. 128—640 13 Claims



1. In an essentially dry disposable biomedical electrode comprising an electrode plate having an upper surface and a lower body-contacting surface, said upper surface having means for electrically connecting said electrode plate to a lead wire, and a conductive material on said body-contacting surface of said electrode plate for enhancing electrical connection with the skin, the improvement wherein said conductive material consists essentially of a dermally nonirritating, conformable, cohesive, non-ionic synthetic hydrophilic polymer containing at least 15 mole percent of a water-soluble monomer, said electrode having an impedance of 500 Kohms or less at a frequency of 10 Hertz.

4,273,136
ELECTRONIC SPHYGMOMANOMETER

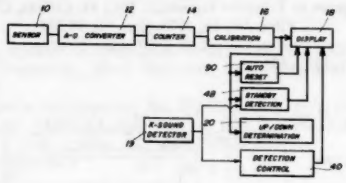
Kimio Kubo, Nara, and Ryuichi Miyamae, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 22, 1978, Ser. No. 963,134

Claims priority, application Japan, Nov. 24, 1977, 52-158002[U]; Nov. 25, 1977, 52-158485[U]; Nov. 30, 1977, 52-162424[U]

Int. Cl.³ A61B *5/02*

U.S. Cl. 128—680 **11 Claims**



1. A blood pressure measurement system including a pressure cuff comprising:

a sensor for detecting a cuff pressure having applied and pulsatile components;

means for providing blood pressure data derived from said sensor, said blood pressure data including data representative of successive sampled cuff pressures; and

applied cuff pressure change determination means for determining whether the applied component of said cuff pressure is increasing for preparation purposes or decreasing for measurement purposes, said determination means including;

comparing means for comparing the current sampled cuff pressure with the last sampled cuff pressure;

detecting means for detecting and producing an enabling signal when the difference between the current sampled cuff pressure and the last sampled cuff pressure is smaller than a predetermined value; and

means responsive to said enabling signal for developing a blood pressure measurement mode signal to enable blood pressure determination when said enabling signal is produced by said detecting means.

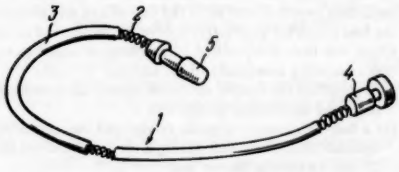
4,273,137
ELECTRICAL CONDUCTOR FOR IMPLANTATION INTO HUMAN BODY

Nikolai L. Pravoverov, ulitsa Pervomaiskaya, 16, kv. 4, Istra Moskovskoi; Ravil N. Nazyrov, MIZ, dom 31-1, Mozhaisk; Sergei S. Grigorov, prospekt Vernadskogo, 105, korpus 2, kv. 81, Moscow, and Lidia S. Turova, ulitsa Jubileinaya, 13, kv. 59, Istra Moskovskoi, all of U.S.S.R.

Filed Dec. 17, 1979, Ser. No. 104,390

Int. Cl.³ A61N *1/04*

U.S. Cl. 128—784 **4 Claims**



1. An electrical conductor for implantation into human body, comprising: an insulating sheath; conductive fibers placed in said insulating sheath; tubes made of high-strength, corrosion-proof. nontoxic alloy, forming said fibers; a filler of said tubes made of a highly electrically conductive metal or alloy.

4,273,138
DISCHARGE ARRANGEMENT FOR AN AXIAL FLOW ROTARY SEPARATOR

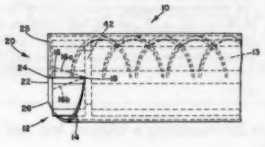
Klaus H. Pauli, Bad Homburg, Fed. Rep. of Germany, assignor to Deere & Company, Moline, Ill.

Filed Jul. 5, 1979, Ser. No. 54,734

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1978, 2830164

Int. Cl.³ A01F *12/00*

U.S. Cl. 130—27 T **10 Claims**



1. In an axial flow rotary separator for a combine in which a generally cylindrical and at least partially foraminous separator housing wall surrounds a rotatably mounted threshing and separating rotor having a particular direction of rotation, in which housing and rotor cooperate as the rotor rotates to process crop material in an annular space between rotor and housing and convey at least a portion of that crop material in a generally helical path downstream for discharge from the separator, a discharge arrangement comprising an opening in the housing wall having discharge edges including an exit edge extending approximately in a helix lying in the housing wall and of the same hand as the helical path of the crop material being conveyed through the separator and having, in relation to the direction of rotor rotation, first and second ends.

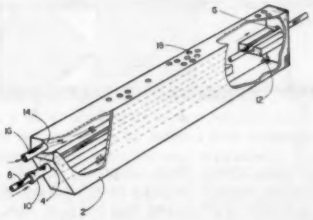
4,273,139
FIRMNESS IMPROVEMENT IN CIGARETTE ROD

George W. Bentley, Clarksville, Ind., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Dec. 20, 1979, Ser. No. 105,812

Int. Cl.³ A24C *5/04, 5/60*

U.S. Cl. 131—280 **7 Claims**



1. An apparatus for improving the firmness of cigarette rods comprising:

a housing having spaced aligned inlet and outlet openings to receive a cigarette rod therethrough;

guide means between said inlet and outlet openings to guide a cigarette rod through said housing; and,

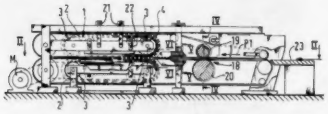
a gas supply opening in the housing in flow communication with a gas supply source and means for maintaining at

least 5 psig gas pressure in said housing while said cigarette is travelling through said housing at a predetermined velocity so as to reorient said tobacco particles.

4,273,140
DEVICE FOR SPREADING INDIVIDUAL TOBACCO LEAF HALVES

Petrus A. H. Eijsermans, Eindhoven, Netherlands, assignor to B.V. Arenco P.M.B., Best, Netherlands

Filed Jan. 23, 1979, Ser. No. 5,717
Claims priority, application Netherlands, Feb. 17, 1978, 7801797
Int. Cl.³ A24B 5/14
U.S. Cl. 131—328 **12 Claims**



1. A device for stretching a tobacco leaf half comprising in combination:

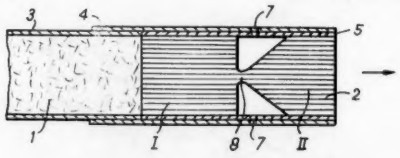
first conveyor means for moving a tobacco leaf half along a first path at a predetermined speed;

second conveyor means for progressively intercepting, stretching and capturing said tobacco leaf half as it is moved by said first conveyor means and moving said tobacco leaf half along a second path divergent from said first path at a speed such that the direction of said second path has a component parallel and equal in speed to said first path and another component perpendicular to said first path whereby said tobacco leaf half is stretched in a direction perpendicular to said first path and captured in stretched state by said second conveyor means as it is moved along said second path.

4,273,141
SMOKE FILTERS

Jan Van Tilburg, 74 Lyceum Straat, Alkmaar, Netherlands

Filed Mar. 14, 1978, Ser. No. 886,399
Claims priority, application United Kingdom, Mar. 14, 1977, 10607/77; May 28, 1977, 22634/77; May 31, 1977, 23042/77; Jun. 21, 1977, 25954/77; Nov. 8, 1977, 46317/77; Nov. 15, 1977, 47417/77; Jan. 23, 1978, 2576/78
Int. Cl.³ A24D 3/04
U.S. Cl. 131—336 **1 Claim**

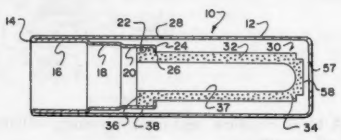


1. A tobacco smoke filter comprising a body of tobacco smoke filtering material having a peripheral region, wrapping forming a tubular wall around said body, at least one cavity defined and substantially wholly enclosed by said body and wrapping and extending all to said tubular wall, each said cavity having a shape causing a variation, across the filter of the rate of smoke flow into the cavity, air-permeable means in said wrapping allowing direct passage of external ventilating air into said cavity or cavities through said wrapping, each said cavity having an upstream peripheral extremity, said air-permeable means being concentrated at said extremity, each said cavity further having an upstream wall extending obliquely downstream from said tubular wall, said filter body constraining the smoke flow in said cavity or cavities to concentrate at a peripheral region and said air-permeable means being disposed at said region of concentrated smoke flow whereby at least a major portion of tobacco smoke and said ventilation air entering said cavity or cavities form a mixture over a region of the filter extending inwardly of its peripheral region.

4,273,142
SMOKING FILTERS

Gerald T. Swanson, and John Trenary, both of Ft. Collins, Colo., assignors to Teledyne Industries, Inc., Ft. Collins, Colo.

Filed Jul. 16, 1979, Ser. No. 58,083
Int. Cl.³ A24D 3/00; A24F 7/04
U.S. Cl. 131—339 **28 Claims**



1. A smoking filter comprising:

an elongated tubular shell one interior end portion of which is shaped to define a coupling to a smoking device and longitudinally of said coupling being shaped to define a tubular wall of predetermined cross-section;

means defining an air inlet through the outer wall of said shell;

a filter element, of a rigidified porous plastic material inhibitive to the passage of substances in said smoke and in the form of an elongated hollow sleeve one integral and commonly-formed end of which is closed and the other end of which is open; means supporting said filter element within said tubular shell beyond said coupling.

4,273,143
PERMANENT WAVE COMPOSITION

Ernest J. Klemm, Thornwood, N.Y.; Walter W. Edman, Westport; Frances E. Erskine, Fairfield, and Everett G. McDonough, Stamford, all of Conn., assignors to Zotos International, Inc., Darien, Conn.

Filed Jul. 17, 1979, Ser. No. 58,264
Int. Cl.³ A45D 7/00
U.S. Cl. 132—7 **18 Claims**

1. A composite product for permanently waving a head of hair having hair fibers of vastly diverse condition intermixed throughout the head of hair, including up to 50% bleached hair fibers intermixed with unbleached hair fibers, and eliminating the necessity for segregation of the hair fibers into groups of hair fibers of similar condition, the composite product comprising

A. a first, wrapping composition for readying the hair fibers by equalizing the diverse condition of the hair fibers, imparting protection to all of the hair fibers, and preparing the hair fibers for interactive receipt of the second composition, the first composition comprising an aqueous solution consisting essentially of, in addition to water:

(a) a disulfide derivative of a mercaptan incorporating at least one substituent group, and

(b) a hair substantive organic compound incorporating a lipoidal alkyl chain and having a total of between about 10 and 18 carbon atoms; and

B. a second, processing composition absorbable into the readied hair fibers for imparting a permanent wave thereto, comprising an aqueous solution consisting essentially of, in addition to water,

(a) a thioglycolate ester or salt, and

(b) at least one selected from the group consisting of

mercaptans with at least one substituent group and disulfide derivatives of mercaptans with at least one substituent group,

whereby a head of hair having mixed hair fibers of vastly differing conditions is capable of being permanently waved as a single entity, without requiring segregation of the hair fibers into groups of hair fibers of similar condition and without experiencing either breakage of the bleached hair fibers or under-waving of unbleached hair fibers, by readying all of the hair fibers for receipt of the waving composition and employing a waving composition formulated for optimum interaction with the readied hair fibers.

4,273,144

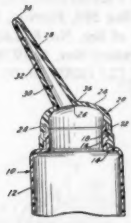
HAIR PARTING AND LIQUID SPREADING DEVICE

Shila Morganroth, 20413 Willowick Dr., Southfield, Mich. 48075

Continuation-in-part of Ser. No. 592,764, Jul. 2, 1975, Pat. No. 4,211,247. This application Dec. 12, 1977, Ser. No. 859,740

Int. Cl.³ A45D *40/26*

U.S. Cl. 132—88.7 **53 Claims**



1. A hair parting and liquid spreading device comprising a tubular flange surrounding an axis having means for removably holding the device in liquid tight relation to a squeeze bottle, closure means secured to the upper end of said tubular flange having a discharge outlet therein, and an elongated, hollow projection surrounding an axis connected at one end to and extending upwardly from said closure means around said discharge outlet, said projection having an outside dimension in cross section at the end connected to said closure means which is small relative to the dimension of said closure means and terminating in an opposite end capable of penetrating and parting the hair and having a liquid spreading surface on a side wall extending upwardly from said closure means adjacent to its periphery, and there being at least one discharge orifice in the liquid spreading surface thereof.

4,273,145

HIGH MOLECULAR WEIGHT VINYL ACRYLIC COMBINED WITH LOW MOLECULAR WEIGHT VINYL ACETATE-MALEATE FOR CONTROLLED PERMANENT TACK AND METHOD OF MAKING SAME

David Lester, Arlington, and Robert R. Alexander, Waltham, both of Mass., assignors to Polymerics, Inc., Waltham, Mass.

Filed Jun. 13, 1979, Ser. No. 48,053

Int. Cl.³ C08L *31/04*

U.S. Cl. 132—1 R **8 Claims**

1. A polymeric composition having controlled permanent tack for use in making unsupported decorative films comprising:

86 to 88 parts of a vinyl acetate-acrylic copolymer of high molecular weight in excess of one million and low residual tack;

14 to 12 parts of a vinyl acetate-maleate copolymer of low molecular weight in the range of 55–35,000 and high residual tack, wherein said vinyl acetate-acrylic copolymer comprises,

Ingredients	Parts By Weight
Vinyl acetate	77.0
Itaconic acid	1.5
Ethyl acrylate	12.0
Glycidyl methacrylate	2.5
Thiodiethylene glycol	4.0
Sodium Lauryl sulfate	2.5
Ammonium persulfate	0.4
Water	100.0 T.T.S 50%

and, wherein said polyvinyl acetate-maleate copolymer comprises,

Ingredients	Parts by Weight
Vinyl acetate	56.0
Methacrylic acid	1.5
Dioctyl maleate	37.0
Sodium lauryl sulfate	3.5
Hydroxyethyl cellulose	1.5
Ammonium persulfate	0.6
Water	100.0

4,273,146

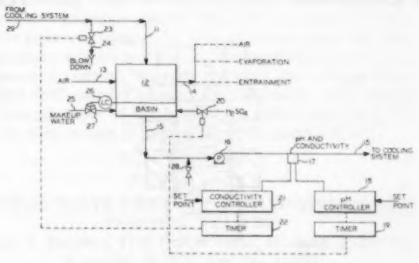
COOLING TOWER OPERATION WITH AUTOMATED PH CONTROL AND BLOWDOWN

Neal W. Johnson, Woods Cross, Utah, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 5, 1979, Ser. No. 1,345

Int. Cl.³ G05D *11/02*

U.S. Cl. 137—5 **4 Claims**



1. In a process for controlling the pH and salts concentration of water in a water circulating system wherein cool water is used to cool warmer fluids by indirect heat exchange and the resulting warm water is cooled and recirculated for further heat exchange, said process comprising measuring the pH of the water and adding acid to the water while the measured pH of the water exceeds a preset pH value, measuring the electrical conductivity of the water and releasing water from the system while the measured conductivity exceeds a predetermined value, adding water to the system to maintain a predetermined volume, the added water having a lower electrical conductivity than the released water,

the improvement comprising

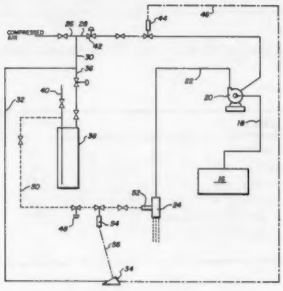
releasing said water from the system intermittently on timed on/off cycles.

4,273,147

TRANSPORTATION AND PLACEMENT OF WATER-IN-OIL EXPLOSIVE EMULSIONS

Robert S. Olney, Bethlehem, Pa., assignor to Atlas Powder Company, Dallas, Tex.

Filed Apr. 16, 1979, Ser. No. 30,425
Int. Cl.[3] F17D *1/16*
U.S. Cl. 137—13 **3 Claims**



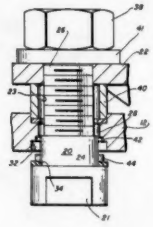
1. A method for transporting water-in-oil explosive emulsions through conduits comprising injecting into said conduit a substantially annular stream of a lubricating fluid at a flow rate such that the linear velocity of said lubricating fluid is substantially equal to that of the explosive emulsion flowing through said conduit wherein said lubricating fluid comprises an aqueous solution of ammonium nitrate.

4,273,148

STEM SEAL FOR A FIRE SAFE BALL VALVE

Raymond J. Charland, South Windsor, Conn., assignor to Litton Industrial Products, Inc., East Hartford, Conn.

Filed Apr. 21, 1980, Ser. No. 142,449
Int. Cl.[3] F16K *41/00*; F15J *15/54*
U.S. Cl. 137—72 **3 Claims**



1. In a ball valve including a cylindrical housing having a flow passage, rotatable ball means for selectively blocking said flow passage, and external actuating means, a fire safe stem seal comprising:

a stem having a selected diameter with a larger diametered shoulder portion on one end including means for engaging the ball means, and an opposite end for engagement with the actuating means,

the housing having a stem bore for matingly receiving said stem therethrough within a selected tolerance, a first interior step concentric with said stem bore and selectively sized to accommodate said stem shoulder, and a second smaller selectively sized interior step concentric with said stem bore having a selected axial depth,

a deformable heat-resistant secondary seal ring having an axial thickness substantially greater than said axial depth of said second step for engagement with the housing in said second step,

a heat-destructible primary seal and bearing ring for engagement with the housing and said heat-resistant ring in said first step, and

means to draw said stem shoulder against said heat-destructible primary ring in said first step which thereby compacts said heat-resistant ring in said second step and into said tolerance to effectively functionally lock said heat-resistant ring in a desired position around said stem,

whereby said heat-destructible ring acts to seal the housing between said first step and said stem shoulder and serves to retain said heat-resistant ring in position to protect it from abrasive stem shoulder rotation while serving as a bearing for said stem shoulder, and

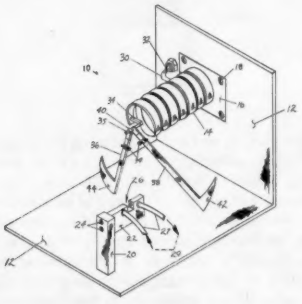
whereby when the valve is subjected to intense heat and said heat-destructible ring disintegrates, said heat-resistant ring acts to seal said housing between said stem bore and second step and said stem and stem shoulder.

4,273,149

BLIND PRESSURE PILOT

David R. Gordon, P.O. Box 591, Harvey, La. 70058

Continuation-in-part of Ser. No. 874,429, Feb. 2, 1978, abandoned. This application Nov. 8, 1978, Ser. No. 958,738
Int. Cl.[3] G05D *16/00*
U.S. Cl. 137—83 **6 Claims**



1. A blind pressure pilot apparatus comprising:

a. a substantially ell-shaped supportive base, said base comprising a lower base portion and an upper base portion connected thereto at substantially right angles;

b. a pressure responsive bourdon tube mounted on said upper base portion and extending therefrom substantially parallel to said lower base portion;

c. an indicating arm mount attached to the projecting end portion of said bourdon tube, said indicating arm mount comprising a pivot arm connected at one end portion thereof to said bourdon tube and a shaft attached to the other end portion of the pivot arm, said shaft having it's central axis generally aligned with the central axis of said bourdon tube, said shaft rotating responsive to pressure changes within said bourdon tube;

d. a pair of indicating arms pivotally and frictionally attached to said indicating arm mount shaft portion each of said indicating arms being independently, pivotally movable on said shaft, each of said arms providing an extreme interrupting flag member at it's end portion away from said shaft, said flags thus moving through and defining a generally arcuate path, each of said interrupting flag members traveling generally through said defined arcuate path responsive to pressure changes within said bourdon tube, said arcuate path generally parallel with said upper base portion; and

e. a gap sensor providing a stream of continuous control air

flowing across a portion of said defined arcuate path, said gap sensor body comprising,

i. a gap sensor body attached to said lower base portion;

ii. a gap formed in said gap sensor body, and projecting across a portion of said gap,

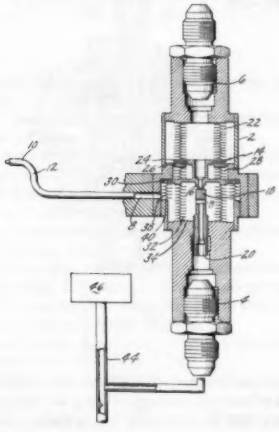
iii. a gap bore provided in said gap sensor body and projecting across a portion of said gap and said defined arcuate path,

iv. a supply stream of control air flowing through said gap bore and across said gap and said arcuate path, the registration of one of said flag members with said supply streams causing an interruption of said supply stream at said gap.

4,273,150
LEVERLESS PRESSURE TRANSDUCER

Stanley R. Paduch, Somers, and Robert K. Olson, Bloomfield, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 26, 1979, Ser. No. 97,585
Int. Cl.³ G05D *16/00*
U.S. Cl. 137—85 **9 Claims**



1. A pressure transduer including:

a casing having a hydraulic fluid inlet and outlet and a gas pressure inlet;

a movable valve plate in said casing between the fluid inlet and outlet having a nozzle therein;

a valve element in said casing in a position to be engaged by said plate to more or less close said nozzle;

a plurality of bellows connected to and supporting said plate for movement toward and away from said valve element; and

means for exposing one side of one bellows to gas from the gas pressure inlet and for exposing one side of each of two bellows to the hydraulic fluid pressure on opposite sides of the nozzle plate, the bellows exposed to the gas being larger than and surrounding one of the bellows exposed to the hydraulic fluid pressure and the space between these bellows being evacuated.

4,273,151
IN-LINE RELIEF VALVE

James E. Nezworski, Milwaukee, Wis., assignor to The Perlick Company, Inc., Milwaukee, Wis.

Filed Oct. 4, 1979, Ser. No. 81,698
Int. Cl.³ G05D *11/00*
U.S. Cl. 137—115 **6 Claims**

6. A safety relief valve that is connectable between a source of fluid under pressure and a location to which fluid flows from said source, and whereby pressure at said location is prevented from exceeding a predetermined value, said relief valve being characterized by:

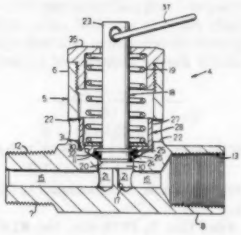
A. a body that defines

(1) a vented valve cage having an axis,

(2) a coaxial annular valve seat at one end of said valve cage having an annular seating surface that faces into the valve cage,

(3) a pressure chamber having said valve seat at one side thereof and communicable with the valve cage therethrough, and

(4) a pair of tubular nipple portions having bores which extend into the body from opposite sides of said axis, in substantially symmetrical relation thereto, and which are communicated with the pressure chamber at their inner ends;



B. a coaxial valve element in said valve cage, movable axially to and from a closed position engaging said annular seating surface, said valve element

(1) having a pressure surface which faces into the pressure chamber through the valve seat and

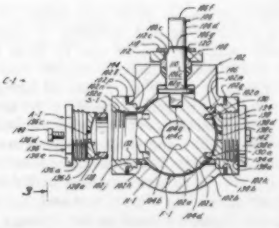
(2) being yieldingly biased towards said closed position; and

C. a baffle in the body between the inner ends of said bores, said baffle being in substantially parallel and symmetrical relationship to said axis and projecting from the side of the pressure chamber opposite the valve seat partway across the pressure chamber, to be at all times spaced from said pressure surface and permit communication through the pressure chamber between the inner ends of said bores, said baffle causing pressure fluid that flows into the body through either of said bores to be deflected towards said pressure surface to impose impact pressure thereon.

4,273,152
CONTROL VALVE ASSEMBLY WITH ONSTREAM SEAL REMOVAL FEATURE

Murray E. Freeman, 1710 Hollow Hook, Houston, Tex. 77080

Filed Feb. 9, 1979, Ser. No. 10,717
Int. Cl.³ F16K *43/00, 5/06*
U.S. Cl. 137—315 **14 Claims**



1. A control valve assembly with onstream seal removal feature for controlling fluid flow in a flowline, comprising:

a housing adapted to be mounted with the flowline, said housing having a flow control cavity formed therein, said flow control cavity in flow communication with the flowline;

flow control means mounted in said flow control cavity for controlling fluid flow through said housing wherein said flow control means includes a ball valve for controlling fluid flow through said housing;

seal means for preventing the unwanted migration of fluid flow between said housing and said ball valve, said seal means having an external sealing surface;

said seal means mounted with said ball valve for engaging said flow control cavity of said housing at said external sealing surface to prevent fluid migration therebetween;

access means mounted with said housing for providing access to said seal means while maintaining fluid flow to said housing; and,

redundant seal means adapted to engage said housing, said access means and said ball valve said redundant seal means continuously engages said ball valve and for preventing fluid migration therebetween said ball valve and said flow control cavity during removal or inspection of said seal means.

4,273,153

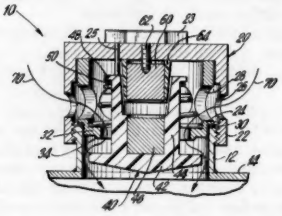
VIBRATION RESISTANT PRESSURE ACTUATED VACUUM BREAKER

J. James Brown, Red Bank, N.J., assignor to Girard Equipment, Inc., Rahway, N.J.

Filed Oct. 9, 1979, Ser. No. 82,679

Int. Cl.³ F16K *31/11, 17/00*

U.S. Cl. 137—454.5 **13 Claims**



1. A pressure actuated vacuum breaker for mounting on the top of a movable tank above the level to which the tank is normally filled with product for admitting atmospheric air to the tank to relieve a reduced pressure condition occurring in the tank while substantially preventing the escape of product or product vapor from the tank via the vacuum breaker, the vacuum breaker being highly resistant to opening due to vibration associated with movement of the tank, comprising:

a housing communicating with the interior of the tank and vented to the atmosphere;

a downward facing closure seat disposed in the housing between the interior of the tank and the vent to the atmosphere;

a light-weight, vertically reciprocal closure assembly disposed in the housing and including a closure member cooperable with the closure seat to close the vacuum breaker and a first permanent magnet mounted on the closure member and having an upward facing pole;

a second permanent magnet mounted in the housing above the first permanent magnet and having a downward facing pole so that the first and second magnets attract one another with a magnetic force equal to at least about 5 times the weight of the closure assembly to hold the closure member up against the closure seat and thereby maintain the vacuum breaker closed in the absence of reduced pressure in the tank and in spite of accelerations due to vibration up to at least about 4 times gravitational acceleration tending to open the vacuum breaker, the force of attraction between the magnets being overcome and the closure assembly moving downward to open the vacuum breaker when a reduced pressure condition occurs in the tank;

a shielding assembly disposed in the housing and substantially surrounding the first and second magnets at all times during operation of the vacuum breaker; and

spring means for exerting an upward return force on the closure assembly to assist in closing the vacuum breaker after it has opened.

4,273,154

DEVICE FOR REGULATING THE VACUUM IN A VACUUM LINE SYSTEM, ESPECIALLY FOR MILKING INSTALLATIONS

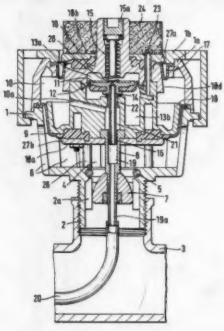
Hermann Moldenhauer, and Kurt Muller, both of Dusseldorf, Fed. Rep. of Germany, assignors to A. und K. Muller GmbH & Co. KG, Dusseldorf, Fed. Rep. of Germany

Filed Feb. 6, 1980, Ser. No. 118,874

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1979, 2905199

Int. Cl.³ F16K *31/126*

U.S. Cl. 137—490 **10 Claims**



1. In a device for the control of the vacuum in a vacuum line system and of the type having a casing including a connecting piece connectable to a vacuum line, a main valve disposed in the casing including a main valve chamber which has a valve seat on one side facing the connecting piece, air intake apertures in its outside walls, means forming a control chamber in the casing and to which the vacuum dependant upon the vacuum in the vacuum line is applicable including a first membrane, a main valve body connected by a valve stem to the first membrane and by which the main valve chamber is separated from the control chamber such that the position of the main valve body with respect to the valve seat is dependent upon the vacuum in the control chamber and an auxiliary valve disposed in the casing for influencing the vacuum in the control chamber and including an auxiliary valve body, an auxiliary valve seat, means adjustably biasing the auxiliary valve body into the auxiliary valve seat including a coil spring and an auxiliary membrane joined to the auxiliary valve body and separating first and second auxiliary chambers of which a first is connectable to the vacuum line and a second to the atmosphere for producing a force responsive to the pressure difference to lift the auxiliary valve body from the auxiliary valve seat against the force of the coil spring, the improvement comprising a support movably mounted in the casing having the auxiliary valve disposed therein and movable therewith and on which the stem of the main valve is disposed and which presents active surfaces of different size to the interior of the main valve chamber and to the atmosphere and wherein the means forming the control chamber comprises a second membrane closing off the control chamber on the side facing away from the main valve chamber and adjoining the atmosphere,

means joining the first and second membranes to the casing and to the movable support and means forming a main fluid passage connecting the control chamber and the first auxiliary chamber to the vacuum line through the movable support, the main valve stem and the main valve body.

4,273,155

BACK-PRESSURE VALVE FOR HEATING INSTALLATIONS

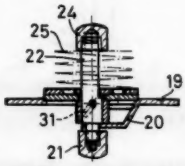
Karl Euerle, Bruckstrasse 73, D-7463 Rosenfeld 1, Fed. Rep. of Germany

Filed May 7, 1979, Ser. No. 36,904

Claims priority, application Fed. Rep. of Germany, May 9, 1978, 7813921[U]

Int. Cl.³ F16K *15/02*

U.S. Cl. 137—543.17 **1 Claim**



1. An improved back-pressure valve assembly, specifically for heating installations, comprising

an annular mask mounted within a throughflow opening formed in a pump,

first and second superposed sheet metal sealing disks having at least one eccentric opening each and positioned thereon such that they at least partially overlap when positioned proximate to each other,

a central stud extending through said throughbore opening and said sealing disks,

spiral groove guiding means mounted on said stud between said first sealing disk and said stud and cooperating means on said first sealing disk for rotating said first sealing disk when being axially moved,

said second sealing disk being mounted on said stud for linear shifting movement only, and

a spring pushing said sealing disks against said mask in closing direction,

whereby said openings are offset with respect to each other when the valve is closed and said openings overlap forming a passageway when the valve is open.

4,273,156

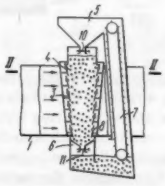
SHUTOFF DEVICE

Alexandr A. Borodin, Schelkovskoe shosse, 17, korpus 1, kv. 21, Moscow, U.S.S.R.

Filed Mar. 28, 1980, Ser. No. 134,749

Int. Cl.³ F16K *35/06*

U.S. Cl. 137—601 **3 Claims**



1. A shutoff device for closing a large-area gas duct, comprising a gas duct; two rows of swivel louvre grills arranged in said gas duct at an angle to the vertical plane and spaced apart more widely in the top portion of said gas duct than in the bottom portion thereof; a hopper located above said swivel louvre grills, and a receiving hopper located under the swivel louvre grills so as to establish a lock chamber confined within said hoppers, the gas duct walls and the swivel louvre grills; said lock chamber being filled, when the gas duct is being closed, with bulk material from said hopper, said bulk material causing the swivel louvres of the grills to jam, and when the gas duct is being opened, said lock chamber is emptied of the bulk material, which is poured down by gravity to said receiving hopper; said hopper and receiving hopper being interconnected through a conveyer for the bulk material to return to the top hopper.

4,273,157

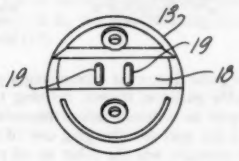
THREE WAY BUTTERFLY VALVE

George C. Ludwig, Owosso, Mich., assignor to Tom McGuane Industries, Inc., Madison Heights, Mich.

Filed Nov. 13, 1978, Ser. No. 959,743

Int. Cl.³ F16K *5/00*

U.S. Cl. 137—887 **10 Claims**



9. In a butterfly valve, the valve comprising:

a housing having an opening therethrough, at least a portion of said opening defining a cylindrical passage;

a bypass passageway mounted to the side of said housing, said passageway further having a projection which protrudes approximately midway into said cylindrical passage, said projection further having a face seat on its protruding end;

a pivot pin mounted diametrically through said housing across said cylindrical passage in spaced relationship to said face seat on said projection;

a metal valve plate engaged to said pivot pin, said valve plate having a diametrically extending central flat planar portion which extends radially of said cylindrical passage and perpendicular to the axis of said cylindrical passage when said valve plate is in inclined position with respect to the axis of said cylindrical passage whereby said valve plate stops the flow of fluid through said cylindrical passage and permits the flow of fluid through said bypass passageway when said valve plate is in a first predetermined position and said valve plate restricts the flow of fluid through said bypass passageway and permits the flow of fluid through said cylindrical passage when said valve plate is in a second predetermined position;

said valve plate having at least the peripheral portion thereof formed with a resilient gasket that engages the interior surface of said cylindrical passage when said planar portion is perpendicular to the axis of said cylindrical passage and the general plane of the valve plate forms an acute angle with respect to the axis of said cylindrical passage;

means for restricting the flow of fluid through said bypass passageway when said valve plate is in parallel position with respect to the axis of said cylindrical passage and in positional relationship to said face seat on said projection;

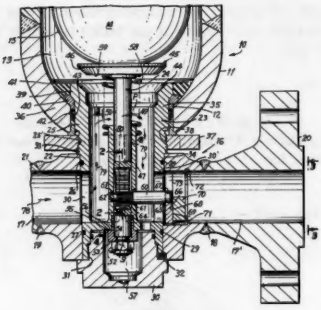
a resilient orifice mounted in said cylindrical passage so that the fluid downstream of said valve plate is restricted to a predetermined pressure level; and

whereby said planar portion of said valve plate is first positioned centrally of said cylindrical passage with said flat portion engaging said pin before fastening said plate to said pin.

4,273,158
PRESSURE PULSE DAMPENING DEVICE

Hugh Chun, Hacienda Heights, Calif., assignor to Greer Hydraulics, Incorporated, Chatsworth, Calif.

Filed May 9, 1979, Ser. No. 37,387
Int. Cl.[3] F16L *55/04*
U.S. Cl. 138—30 8 Claims



1. A pressure pulse dampener comprising a pressure vessel having a movable partition therein defining two chambers, each having a port in communication therewith, one of said ports defining a gas port for charging one of said chambers with gas under pressure, and the other an oil port, a housing associated with said pressure vessel, said housing including a transverse flow passage in communication with said oil port and a through flow passage connected with said transverse flow passage and having an inlet port and an outlet port adapted to be interposed in a hydraulic line, a hollow sleeve rigidly secured to said housing and extending into said vessel through said oil port, said sleeve having an upper end disposed within said vessel and defining a valve seat, said sleeve having transversely directed openings in alignment with said through flow passage, a valve member mounted for axial movement relative to said sleeve and including a head axially shiftable between closing and opening positions of said seat, and a stem disposed within said sleeve, a variable flow control valve in said through flow passage, and drive means operatively connecting said stem and said variable flow control valve for varying the effective area of said flow control valve responsive to movements of said valve stem within said sleeve.

4,273,159
EARTH BORING APPARATUS WITH MULTIPLE WELDS

Jimmie B. Bolton, Conroe, and Sam T. Crews, Houston, both of Tex., assignors to Smith International, Inc., Newport Beach, Calif.

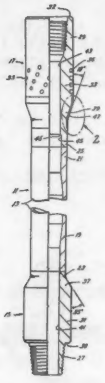
Filed Mar. 16, 1978, Ser. No. 887,005
Int. Cl.[3] F16L *9/04*
U.S. Cl. 138—109 18 Claims

1. Drill pipe comprising a steel tube having a pin tool joint member welded to one end and a box tool joint member welded to the other end,

said tool joint members each comprising a tubular body of hardenable steel, said body including a medial portion having a generally cylindrical outer periphery, a thread ring at one end of the body, a weld neck at the other end of the body, and a tapered shoulder between the neck and medial portion,

the body of the box tool joint member having an annular groove thereabout extending over the shoulder and a portion of the weld neck adjacent to said shoulder,

said box tool joint member further comprising a butter layer of non-hardenable steel welded into said annular groove, said butter layer having an annular groove thereabout extending over said shoulder and into said weld neck, said groove in said butter layer being filled with hard facing, said hard facing and the part of the butter layer beyond the ends of said groove therein being flush with the adjacent surfaces of the weld neck and medial portion of the

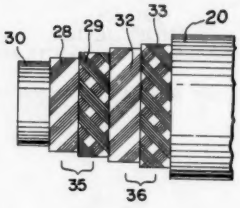


body of the tool joint member, the steel of said butter layer being non-hardenable in the sense that by heat treatment alone the steel cannot have its hardness increased over 255 Brinnell.

4,273,160
HIGH PRESSURE HOSE

David C. Lowles, Chagrin Falls, Ohio, assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Continuation of Ser. No. 832,325, Sep. 12, 1977, abandoned, which is a continuation of Ser. No. 747,713, Dec. 6, 1976, abandoned. This application Jan. 16, 1979, Ser. No. 3,844
Int. Cl.[3] F16L *138/125*
U.S. Cl. 138—124 6 Claims



1. A flexible reinforced hose for conveying fluids under pressure comprising a radially expansible core tube of flexible elastomeric material and at least two layers of stranded reinforcement over the core tube, such strands having an angle of lay such that each layer will expand radially upon application of radially outward force thereto, the material of the outermost layer having a modulus of elasticity that is greater than that of the innermost layer, none of such layers having a modulus of elasticity greater than that of any succeeding radially outward layer, and said layers including an intermediate layer of stranded reinforcement having a modulus of elasticity between that of the innermost layer and that of the outermost layer.

4,273,161

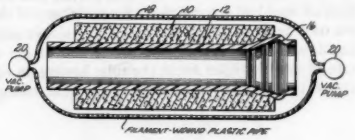
INSULATED PLASTIC PIPE PRODUCT AND METHOD

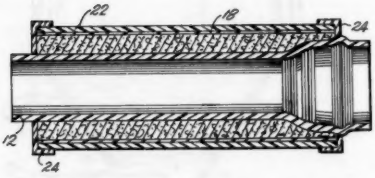
Hugh T. McLaughlin, Santa Ana, Calif., assignor to Ameron, Inc., Monterey Park, Calif.

Division of Ser. No. 612,659, Sep. 12, 1975, which is a continuation of Ser. No. 513,481, Oct. 9, 1974, abandoned. This application Nov. 17, 1975, Ser. No. 632,571

Int. Cl.³ F16L *9/14*

U.S. Cl. 138—149 **7 Claims**





1. An insulated pipe construction comprising a rigid carrier pipe, a rigid tubular outer shell disposed concentrically around and spaced from the carrier pipe, a partially compressed, volumetrically deformable insulation layer in the space between the carrier pipe and the outer shell, and a flexible, imperforate tube normally having an inside diameter greater than that of the outer shell encasing the insulation layer and embedded between the outer shell and the partially compressed insulation layer.

4,273,162

BRAKING APPARATUS FOR TAPE ROLLERS OF WEAVING SHUTTLES

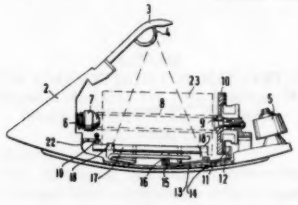
Frank Bosse, Tecklenburg, Fed. Rep. of Germany, assignor to Windmöller & Hölscher, Lengerich, Fed. Rep. of Germany

Filed Oct. 17, 1979, Ser. No. 85,541

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1978, 2846920

Int. Cl.³ D03D *37/00*

U.S. Cl. 139—13 A **6 Claims**



1. Apparatus for braking a tape roller positioned in a weaving shuttle of a circular loom comprising:

a rocker shafter (**17**) mounted parallel to an axis of a tape roller positioned in a body of the shuttle;

guide yoke means (**21**) secured on the rocker shaft for guiding tape;

radially extending abutment means (**10**) carried by the rocker shaft for limiting movement thereof;

first spring means (**20**) engaging the rocker shaft for pivoting the guide yoke means against a force exerted by tape being withdrawn from the taper roller;

means for braking the tape roller effective on pivoting of the guide yoke means by the first spring means when the force exerted by the withdrawn tape is reduced by tape slackage or breakage;

a plurality of rotatable seating means in the weaving shuttle for clamping the tape roller, one of the seating means (**9**) having a disc (**10**) which forcibly rotates with the tape roller (**23**), the means for braking including a brake shoe (**12**) engageable with the disc (**10**), and second spring means (**15**) for connecting the brake shoe to the rocker shaft so that, on pivoting of the guide yoke means (**21**), the second spring means (**15**) increases the braking force against the first spring means (**20**) which pivots against the tape tension;

the means for braking further including a two-armed lever (**13**), and a shaft (**14**) carried by the shuttle for pivotally mounting the two-armed lever (**13**), the brake shoe (**12**) being secured to one end of a lever arm of the two-armed lever, the end of the other lever arm of the two-arm lever being connected by the second spring means (**15**) to the rocker shaft (**17**).

4,273,163

FABRIC TAKE-OFF DEVICE

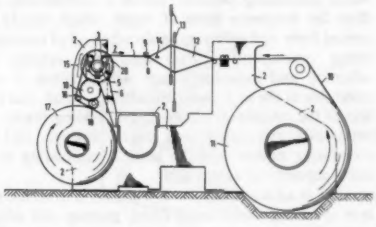
Erwin Pfarrwaller, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jan. 16, 1979, Ser. No. 3,901

Claims priority, application Switzerland, Jan. 19, 1978, 498/78

Int. Cl.³ D03D *49/20*

U.S. Cl. 139—308 **16 Claims**



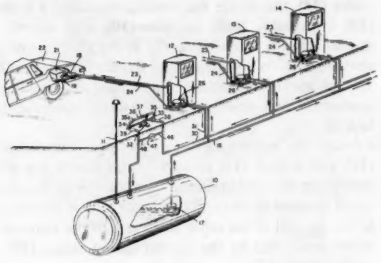
1. A fabric take-off device for a travelling web of a fabric, said device comprising

a plurality of supports disposed across a given weaving width;

a pair of longitudinally elongated guide elements mounted on said supports in spaced relation to each other to define a gap of predetermined size therebetween, each said element extending across said weaving width on a fixed longitudinal axis for passage of the travelling web thereabout with at least the upstream guide element being driveless; and

a take-off roller of a diameter greater than said size of said gap disposed between said guide elements relative to the travelling web for passage of the travelling web thereover, said roller being drivingly rotatable about a longitudinal axis thereof and freely movable transversely of said latter axis to define a nip with each said guide element for passage of the web therebetween.

4,273,164
MANIFOLDED FUEL VAPOR
Kenneth M. Gunn, Glenham, N.Y., assignor to Texaco Inc., White Plains, N.Y.
Division of Ser. No. 925,018, Jul. 17, 1978, abandoned. This application Dec. 6, 1978, Ser. No. 967,032
Int. Cl.³ B65B *3/18*
U.S. Cl. 141—7 **5 Claims**



1. Method for providing a substantially constant degree of vacuum assist to a system which carries a volatile liquid, and having means within the system for dispensing said volatile liquid from a liquid holding reservoir to one or more of a plurality of receiving tanks, and for concurrently withdrawing vapors from said one or more receiving tanks being filled to avoid passage of said vapor into the atmosphere, which method includes the steps of;

providing a closed, vapor circulating circuit having an inlet manifolded to the respective receiving tanks, and having an outlet communicated with said liquid holding reservoir, said vapor circulating circuit including a vapor inductor means therein,

introducing vapors from said one or more receiving tanks into said vapor circulating circuit, the latter having a vapor circulating capacity which is substantially greater than the maximum flow of vapor which would be received from said receiving tanks when all of said tanks are being concurrently filled with said volatile liquid, whereby said inductor means will establish a vacuum condition at the said vapor circulating circuit inlet regardless of the number of receiving tanks being filled,

continuously circulating said vapor through said vapor circulating circuit until the latter is circulating its maximum capacity of vapor, and

thereafter as additional vapor is withdrawn from the respective receiving tanks being filled, passing said additional vapor from the vapor circulating circuit into said liquid holding reservoir.

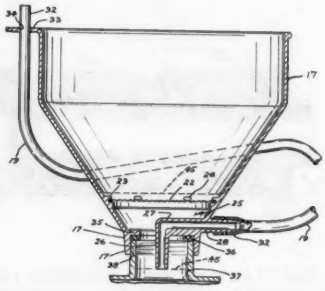
4,273,165
Patent Not Issued For This Number

4,273,166
COMBINATION FUNNEL AND SIPHON
Alan V. Bradley, 616 Lincoln Ave., Crookston, Minn. 56716
Filed Oct. 4, 1979, Ser. No. 81,800
Int. Cl.³ B65B *39/04;* **B67C** *11/00*
U.S. Cl. 141—95 **4 Claims**

1. A funnel for directing liquid into the cap-anchoring filler neck of a tank, comprising

a funnel-shaped receptacle having an open top and a peripheral wall and a lower annular sleeve formed integrally of the receptacle to embrace and seal against the filler neck of the tank and direct liquid into the tank, the sleeve also having an annular ledge facing downwardly to bear and seal against the top of the filler neck, the sleeve having attaching means to anchor the sleeve to the filler neck,

a single rigid depending tube located centrally of and within the annular sleeve and having a size significantly less than the inner diameter of the sleeve to permit free downward flow of liquid all around the inner periphery of the sleeve, the tube having a lower end free of the sleeve and extending downwardly beyond the lower end of the sleeve to extend into the filler neck, the tube having an upper end above the annular ledge and sleeve and being formed



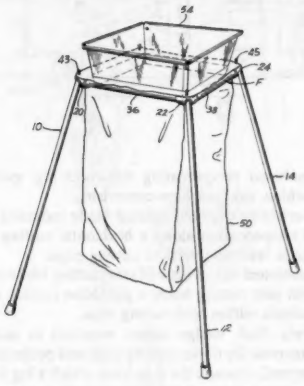
integrally of the receptacle wall, the upper end of the tube extending horizontally and outwardly through the receptacle wall and having a terminal end at the exterior of the receptacle wall, the horizontal upper end of the tube partially obstructing flow through the sleeve, an elongate flexible tubing connected with the terminal end of the rigid tube at the exterior of the receptacle to alternately extend upwardly along the receptacle and downwardly along the annular sleeve,

a metal screen traversing the interior of the receptacle and above the upper end of the tube and indicating the level of the liquid in the receptacle to produce siphoning flow of liquid from the filler neck of the tank, and releasable retainer means on the receptacle wall at the exterior thereof and releasably holding the flexible tubing of the upper end thereof.

4,273,167
TRASH BAG HOLDER
David J. Stillwell, 300 Washington Ave., #201D, Elyria, Ohio 44035
Filed Aug. 30, 1979, Ser. No. 71,038
Int. Cl.³ B65B *1/04*
U.S. Cl. 141—314 **10 Claims**

10. A manually assemblable stand for removably supporting an associated pliable bag of predetermined size comprising; a closed four-cornered rectangular frame, legs depending down-

wardly and outwardly from the four corners of the frame, said frame having each corner thereof formed of a hollow tubular right-angle corner pipe elbow forming rod-receiving sockets disposed at right angles to each other, said frame also having the sides thereof formed of elongated members telescoped into the respective sockets of said corner pipe elbows to form the frame, each of said corner pipe elbows having a leg-receiving socket, said legs being telescoped into said leg-receiving sockets, each of said corner pipe elbows having an upstanding pin secured to the top surface thereof for detachably receiving a



top edge portion of the associated pliable bag to hold such bag on the frame, said pins projecting upwardly and outwardly from the corner pipe elbows, a funnel having its lower portion receivable just within and so disposed the frame to guide the flow of material into the associated pliable bag when such bag is secured to the frame, and a cloth bag secured to said frame and extending downwardly therefrom, whereby the associated pliable bag is placed within the cloth bag and secured to the frame thereby protecting the associated pliable bag from rupturing.

4,273,168

APPARATUS AND METHOD FOR HARVESTING TREES

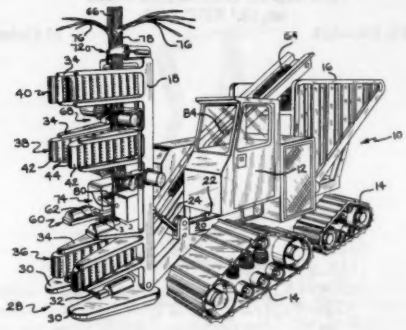
Robert L. Propst, 4141-145th Ave. NE., Bellevue, Wash. 98007

Filed Sep. 24, 1979, Ser. No. 78,649

Int. Cl.³ A01G *23/08*

U.S. Cl. 144—3 D **11 Claims**

1. A timber harvesting machine for converting standing trees to bolt length logs comprising a vehicle frame having a front end, a tree-severing unit on said frame front end, an upright mast assembly on said frame extending upwardly from said severing unit, tree-gripping and feeding means mounted on said mast assembly operable to drive a gripped tree downwardly, a tree cutoff unit disposed below said gripping and feeding assembly and spaced above said severing unit a predetermined distance corresponding substantially to said bolt length, tree-delivery means operable to support and drive a severed tree rearwardly into engagement with said cutoff unit so as to sever a bolt length log from the lower end of said severed tree, and tree cutoff means on said mast assembly located rearwardly of said cutoff unit and below said tree-gripping and feeding means operable to cut additional bolt length logs from the lower end of said tree as said tree-gripping and feeding means is operated to move said tree downwardly.



4,273,169

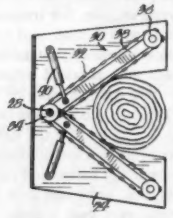
CABLE SAW FOR TREE HARVESTING APPARATUS

Paul W. Baenen, Wausau, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Apr. 12, 1979, Ser. No. 29,196

Int. Cl.³ A01G *23/08*

U.S. Cl. 144—34 R **2 Claims**

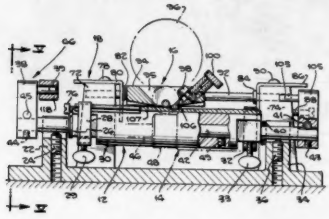


1. In a tree harvesting head having a frame with grapple means supported adjacent one end of said frame for gripping a standing tree and cutting means adjacent an opposite end for severing said tree gripped by said gripping means, said cutting means including a reversible motor supported on said frame and having an output shaft, a drive pulley secured to said output shaft and an idler pulley spaced from said shaft with means between said frame and idler pulley for moving said idler pulley between first and second positions, a cable entrained over said pulleys and having a plurality of spaced cutting elements at spaced locations thereon, each cutting element having first and second cutting edges at opposite ends thereof with each cutting edge extending circumferentially around the entire periphery of said cable and being radially spaced therefrom so that said cutting means will sever a tree while being driven in either direction.

4,273,170
PRECISION REED TRIMMING MACHINE

Norman Herzberg, 16712 Chaplin Ave., Encino, Calif. 91436, and James Compton, Jr., Long Beach, Calif., assignors to Norman Herzberg, Encino, Calif.

Filed Aug. 17, 1979, Ser. No. 67,330
Int. Cl.[3] B27C *1/14*
U.S. Cl. 144—115 12 Claims



1. In an apparatus for trimming woodwind instrument reeds of the type having:

(a) reed supporting means for supporting a generally cylindroidal section of reed material and for allowing said reed section to rotate about its longitudinal axis, said supporting means being removable from said apparatus;

(b) cam means, journalled in parallel relation to said supporting means, for rotative movement about an axis parallel with said longitudinal axis of said reed section, for defining a gradient to be trimmed onto said reed section; and

(c) reed cutting means, pivotally disposed above said supporting means and linearly moveable along said longitudinal axis of said reed section, for trimming said gradient onto one half of said reed section, said reed cutting means including cam following means, rotatably attached to said reed cutting means and disposed adjacent to said cam means, for controlling the trimming of said reed by said cutting means, whereby a reed section mounted upon said supporting means is trimmed by the linear movement of said cutting means along said longitudinal axis of said reed section, as said supporting means and said cam means are rotated about said axis, until said cam following means completely contacts said cam means, whereupon said supporting means is removed from and remounted upon said apparatus to expose both halves of said reed section to said cutting means;

the improvement comprising:

(1) adjustable means, interlocking said supporting means and said cam means, for adjustably maintaining said supporting means and said cam means in a precise fixed rotational relation as said reed is trimmed;

(2) means for vertically changing the axis of rotation of said cam means relative to said supporting means, thereby controlling the depth of said gradient trimmed onto said reed section;

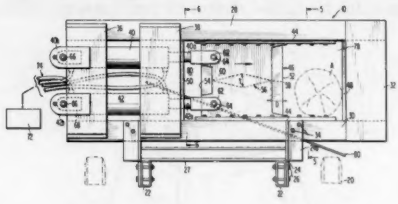
(3) means for determining the precise longitudinal center of said trimmed reed; and

(4) means for orienting said supporting means and said cam means in a precise predetermined rotational relationship when the rotational axis of said cam means is vertically altered by means of said changing means.

4,273,171
DUAL ACTION COMBINATION FIREWOOD CUTTING AND SPLITTING MACHINE

Bert W. Spaulding, Sr., R.F.D. 1, Box 280, Claremont, N.H. 03743

Filed Oct. 15, 1979, Ser. No. 84,692
Int. Cl.[3] B27L *7/00*
U.S. Cl. 144—193 A 10 Claims



1. A combined reciprocating firewood log splitting and cutting machine, said machine comprising:

a thin, vertically oriented cutting blade mounted for horizontal reciprocation along a horizontal cutting path and bearing at least one vertical cutting edge,

a stop positioned in the path of said cutting blade and defining with said cutting blade a guillotine cutting area for a log inserted within said cutting area,

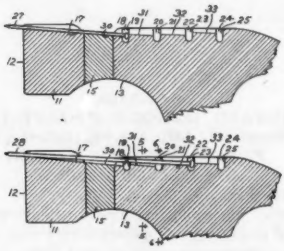
a relatively thick wedge means mounted to said cutting blade rearwardly of the cutting edge and projecting to one side thereof, opposite the side from which a log is inserted, and bearing a tapered splitting edge facing towards said stop with said tapered splitting edge positioned rearwardly of the cutting blade cutting edge; and

means for reciprocating said blade towards and away from said stop to open and close said guillotine cutting area such that during closure of said area there results initial partial severance of a firewood length log section from said inserted log and subsequently, splitting only of said partially severed log section by said wedge means prior to complete severance of said log section from said inserted log.

4,273,172
NAIL HOLDING HAMMER HEAD

Jack D. Hoosier, 488 Hill Rd., Green Lane, Pa. 18054

Filed May 12, 1980, Ser. No. 149,185
Int. Cl.[3] B25C *1/00*; B25D *1/00*
U.S. Cl. 145—30 R 4 Claims



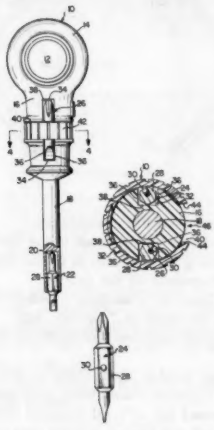
1. A hammer head having a longitudinal groove leading away from the striking face to temporarily receive the shank of a nail to be struck into a receiving surface, and having a plurality of transverse grooves crossing the longitudinal groove along its length at spaced intervals to receive the nail heads and provide nail head abutment surfaces, the bottom of the longitudinal groove being stepped upwardly between said transverse

grooves away from the striking surface so that the heads of finishing nails will bear against said abutment surfaces.

4,273,173
DEVICE FOR TRANSMITTING TORQUE

Lloyd T. Smith; Alan E. Bartholomew, both of Newton; Robert W. Fee; Michael L. Meister, both of Wichita; Richard J. Robbins, Derby, and Richard E. Ten Eyck, Wichita, all of Kans., assignors to S/V Tool Company, Inc., Newton, Kans.

Filed Oct. 17, 1979, Ser. No. 85,812
Int. Cl.³ B25G *1/08*
U.S. Cl. 81—177 M **1 Claim**



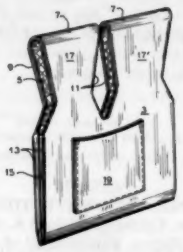
1. In a torque transmitting device,
an elongated stem provided with an enlarged, integral handle;
a shank secured to the stem in axial alignment therewith,
said shank extending from the stem oppositely from said handle,
said stem being provided with an elongated, outwardly-opening, tool-storing slot extending longitudinally of the stem between the handle and the shank,
said slot terminating in a pair of opposed, spaced-apart, radial end walls, one being spaced from the shank and facing toward the handle, the other being adjacent the handle and facing toward the shank, presenting stops for precluding displacement of the tool longitudinally of the slot,
said stem having an outwardly-opening, circumferential groove between the handle and the shank of lesser depth than the slot,
said groove intersecting the slot and otherwise surrounding the stem, the slot being otherwise uninterrupted between said ends thereof; and
a C-shaped, tool-retaining, band-like ring confined in said groove and rotatable about the axis of the stem,
said ring being substantially equal in width to the width of the groove, and having a pair of opposed ends, presenting a space therebetween alignable with the slot upon rotation of the ring, and through which the tool may be inserted into and removed from the slot.

4,273,174
HANDBAG

Mary S. Potter, 1020 Glann Rd., Toledo, Ohio 43607

Filed Sep. 13, 1979, Ser. No. 74,961
Int. Cl.³ B65D *33/06*
U.S. Cl. 150—3 **17 Claims**

1. A flexible container fabricated of a flexible sheet material, said container having equal side walls, said side walls having an upper portion and a lower portion, said upper portion having a central cutout opening and opposed edge cutout openings defining two carrying and closing loops, said lower portion being joined to form the container, each of said loops having a converging portion, a diverging portion and a narrowest point

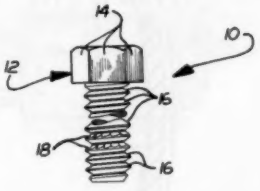


below the midline of the upper portion where said converging portion changes to said diverging portion and a closure defined by said loops formed by passing one of said loops through the other of said loops whereby such container is loosely closed and may be carried by said one of said loops.

4,273,175
THREAD CONVOLUTION

Terry D. Capuano, Hinckley, Ohio, assignor to The Lamson & Sessions Co., Cleveland, Ohio

Filed Apr. 4, 1979, Ser. No. 26,879
Int. Cl.³ F16B *39/02*
U.S. Cl. 411—168 **6 Claims**



1. A first thread convolution adapted to engage a second thread convolution, said first thread convolution comprising first and second flank portions which extend from opposite sides of a crest of said first thread convolution to a root of said first thread convolution, and retainer means for enabling relative rotation to occur between said first and second thread convolutions in a first direction and for retarding relative rotation between said first and second thread convolutions in a second direction which is opposite from said first direction, said retainer means including a resiliently deflectable spring portion which forms part of said first flank portion, said spring portion being integrally formed with said first thread convolution and being resiliently deflectable toward the second flank portion from an extended position to a retracted position under the influence of forces applied to said spring portion by a flank surface of the second thread convolution, said spring portion including surface means for penetrating the flank surface of the second thread convolution and for effecting movement of said spring portion from the retracted position toward the extended position upon relative rotation between said first and second thread convolutions in the second direction, said spring portion being effective to transmit forces retarding relative rotation in the second direction between said first and second thread convolutions upon movement of said spring portion from the retracted position toward the extended position after having penetrated the flank surface of the second thread con-

volution, said surface means including a pointed end portion which is disposed radially outwardly of the pitch diameter of said first thread convolution and is disposed radially inwardly of the crest of said first thread convolution, said pointed end portion extending along the flank of the second thread convolution when said spring portion is in the retracted position and extending into the flank of the second thread convolution when said spring portion moves toward the extended position upon relative rotation between said first and second thread convolutions in the second direction.

4,273,176

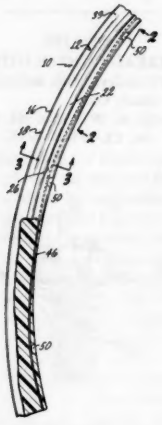
NON-PNEUMATIC TIRE

Ransome J. Wyman, Calabases; Richard A. Alshin, Long Beach, and Charles H. Gilbert, Fullerton, all of Calif., assignors to Carefree Bicycle Tire Company, Marina Del Rey, Calif.

Continuation-in-part of Ser. No. 906,691, May 16, 1978, abandoned. This application May 8, 1979, Ser. No. 37,393

Int. Cl.³ B60C *7/12*

U.S. Cl. 152—327 **10 Claims**



1. An improvement in a non-pneumatic tire having a solid monolithic true body made of a urethane elastomer for the use on a wheel rim having a pair of laterally spaced bead flanges and side walls and a circumferential channel forming the bottom of the rim which comprises:

said tire body having a circumferentially extending tunnel formed on the inside of said tire body;

said tire body having inclined side walls that converge outwardly from each other, the apex of said side walls forming a crown, the tread portion of the tire located at said crown;

each of said side walls terminating in a thickened portion forming a bead shoulder that seats on the top of the head flanges of said wheel rim and including a bead extending essentially downward from said thickened portion;

the portion of said beads distal to said thickened portion forming a lower bead wall;

a bead cord extending essentially circumferentially within said bead proximal to said lower bead wall;

each of said beads fitting into said rim adjacent to one of said walls positioning said cords within said rim between said bead flanges and said bottom of said rim;

said bead cord is held within said bead in the shape of a multisided closed polygon having arcuate shaped sides.

4,273,177

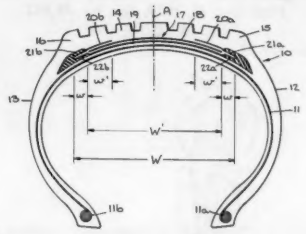
PNEUMATIC RADIAL TIRE WITH FOLDED PLY BREAKER HAVING SOFT CUSHION SURROUNDING BREAKER EDGE

George H. Nybakken, Prospect, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Filed Mar. 31, 1980, Ser. No. 136,182

Int. Cl.³ B60C *9/20*

U.S. Cl. 152—360 **10 Claims**



1. A pneumatic radial tire comprising:

a carcass including a pair of beads and at least one ply having cords extending from one bead to the other and disposed substantially radially of the tire;

a reinforcing breaker extending substantially circumferentially of the tire over said carcass; and

tread and sidewall portions of elastomeric material over said carcass;

said reinforcing breaker comprising an unfolded inner first ply of cord material coated with elastomeric material and an outer second ply of cord material coated with elastomeric material and folded to form two opposed flap portions which fold over on said outer ply and on said inner ply, the edges of said inner ply being spaced apart from the folded edges of said outer ply so that said outer ply has folded two-layer regions; and

a cushion portion of elastomeric material above, at the edge, and below each two-layer region of said outer ply substantially separating said each two-layer region from the adjacent radial carcass ply, tread and sidewall portions, said cushion portions of elastomeric material being softer than said tread portion and softer than said elastomeric material coating said inner and outer plies of said breaker.

4,273,178

VIBRATOR CASTING SYSTEM WITH FEEDBACK

Alexander Goloff, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 9, 1979, Ser. No. 55,588

Int. Cl.³ B22D *2/00, 46/00*

U.S. Cl. 164—4 **16 Claims**

1. An apparatus (**10**) for aiding the flow of a liquid (**12**) in a cavity (**14**) to improve the filling thereof, comprising:

means (**18**) for generating a plurality of waves (**20**) in the liquid (**12**) in the cavity (**14**) at a first location (**50**);

means (**38**) for sensing the waves (**20**) at a second location (**48**) spaced from the first location (**50**), said first location (**48**) of said cavity (**14**) defining a first cross-section generally orthogonal to flow thereat and said second location (**50**) of said cavity (**14**) defining a second cross-section generally orthogonal to flow thereat, a minimum dimension of said first cross-section being significantly smaller than a minimum dimension of said second cross-section; and

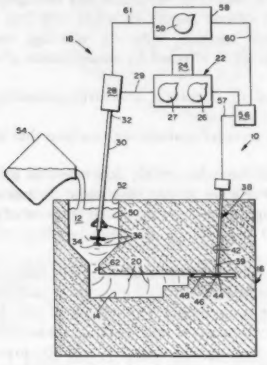
means (**56**) for controlling said generating means (**18**) in response to the waves (**20**) sensed by said sensing means (**38**).

10. A method for filling a cavity (**14**) with a liquid (**12**), comprising:

introducing the liquid (**12**) into the cavity (**14**);

generating waves (**20**) in the liquid (**12**) at a first position (**50**) in the cavity (**14**);

sensing the waves (**20**) in the liquid (**12**) at a second position (**48**) in the cavity (**14**), the second position (**48**) being spaced apart from the first position (**50**), said second position (**48**) being selected such that a minimum dimension of



a cross-section generally orthogonal to flow thereat at said cavity (**14**) at said first position (**50**) is significantly larger than a minimum dimension of a cross-section generally orthogonal to flow thereat at said cavity (**14**) at said second position (**48**); and

controlling the generating of the waves (**20**) responsive to the waves (**20**) sensed.

4,273,179

PHENOLIC RESIN-POLYISOCYANATE BINDER SYSTEMS CONTAINING DIBASIC ESTER SOLVENTS

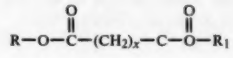
John J. Gardikes, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Aug. 16, 1978, Ser. No. 934,287

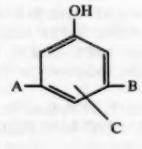
Int. Cl.[3] **C08K** *5/09, 5/10;* **B22C** *1/22*

U.S. Cl. 164—43 **19 Claims**

1. A binder composition comprising in admixture a resin component, a hardener component, and a curing component, said resin component comprising a solution of resin in an organic solvent (comprising at least a dibasic ester of) said solvent comprising a dibasic ester having the following formula:



wherein X is 1, 2, 3, or 4, R is an alkyl group of from one to four carbon atoms and R_1 is an alkyl group of from one to four carbon atoms and said resin is a non-aqueous phenolic resin which comprises a condensation product of a phenol having the general formula:



wherein A, B, and C are hydrogen, hydrocarbon radicals or halogen, with an aldehyde having the general formula R'CHO wherein R' is a hydrogen or a hydrocarbon radical of 1 to 8 carbon atoms; said hardener component comprising a liquid polyisocyanate containing at least two isocyanate groups; and said curing component comprising a tertiary amine.

19. The process of preparing shaped foundry products which comprises:

(a) forming a foundry mix by uniformly distributing on a foundry aggregate containing sand as the major constituent a binding amount of upto 10% based on the weight of the aggregate of a binder composition obtained by combining the phenolic resin component of claim **1** and the hardener component of claim **1**, said polyisocyanate being employed in a concentration of 10 to 500% by weight of the phenolic resin;

(b) shaping the foundry mix in a mold; and

(c) curing the shaped foundry mix with a gaseous tertiary amine catalyst.

4,273,180

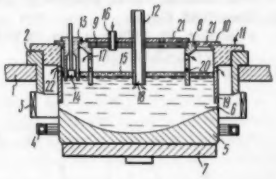
PROCESS AND APPARATUS FOR CONTINUOUS CASTING OF METAL IN ELECTROMAGNETIC FIELD

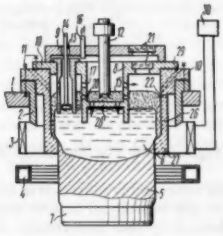
Anatoly S. Tertishnikov, ulitsa Sovetskaya, 42, kv. 9; Boris P. Platunov, ulitsa Sovetskaya, 40, kv.51, both of, Mtsensk Orlovskoi oblasti; Alexei V. Novikov, ulitsa Vvedenskogo, 24, kv. 12, Moscow; Nikolai A. Gordeev, ulitsa Karla Marxa 81, kv. 29, Mtsensk Orlovskoi oblasti; Eduard K. Belebashev, ulitsa Narodnaya, 7, kv. 40; Dmitry P. Lovtsov, ulitsa Butlerova, 10, kv. 132, both of, Moscow; Vladimir A. Korytov, 1 Mikroraion, 6, kv. 67, and Jury P. Ignatiev, 1 Mikroraion, 18, kv. 34, both of, Mtsensk Orlovskoi oblasti, all of U.S.S.R.

Filed Mar. 8, 1979, Ser. No. 18,835

Int. Cl.[3] **B22D** *27/02*

U.S. Cl. 164—49 **16 Claims**





1. A process for continuous casting of metal in electromagnetic field, which comprises delivering a molten metal onto a bottom plate disposed in said electromagnetic field acting to support said molten metal in the form of a column which solidifies from the bottom to the top with a liquid portion at the top of said column and a solidifying skin being formed about said column; feeding a coolant to the side surface of solidified ingot; and providing a protective medium about the liquid portion of said column, said protective medium being held in place at ingot side surface of said liquid portion by means of a funnel-shaped band formed with an annular section with its bottom portion closely adjoining the ingot solidifying skin

above the level from which the coolant is fed to the ingot side surface.

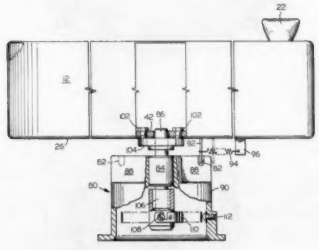
7. An apparatus for carrying into effect the continuous casting of metal in electromagnetic field, comprising: a frame; a ring-shaped baffle for shielding the electromagnetic field mounted onsaid frame; a magnetic inductor mounted on said frame and arranged coaxially with said baffle; a ring shaped cooler mounted on said frame and arranged coaxially with said ring-shaped baffle and said magnetic inductor; said ring-shaped baffle, magnetic inductor and cooler forming and enveloping an ingot-forming space; a bottom plate located in and forming the bottom of said ingot-forming space; a cover positioned above said ring-shaped baffle and forming the top of said ingot-forming space, said cover having a first opening for the ingot-forming metal in molten form to pass therethrough, a second opening for a rod of a metal level float gauge to extend therethrough and indicate the height of the molten ingot-forming metal in said ingot-forming space, and a third opening for a protective medium which prevents oxidation of the molten-ingot forming metal to pass therethrough; at least one shell positioned on said cover in the ingot-forming space and, fixed on said baffle means by a flange in a manner to permit the lower end face of said shell to be immersed in the ingot molten metal to define a portion of the horizontal liquid portion of the ingot surface as being confined within said shell lower end face so that the latter constitutes a boundary around said ingot liquid surface portion, said shell being formed of a refractory nonmagnetic material chemically inert to the protective medium and having low conductivity and means for introducing the protective medium through said third opening onto the ingot liquid surface portion bounded by said shell end face.

4,273,181

CENTRIFUGAL CASTING MACHINE

Irving G. Winer, Yucaipa, Calif., assignor to The J. M. Ney Company, Bloomfield, Conn.

Filed Oct. 30, 1979, Ser. No. 89,523
Int. Cl.³ B22D *13/00*
U.S. Cl. 164—114 **8 Claims**



1. A centrifugal-casting machine comprising:
a. a base;
b. a rotatable subassembly journaled in said base for rotation relative to said base about an axis and having mounting means thereon spaced transversely from said axis and adapted for mounting a centrifugal-casting crucible and mold;
c. drive means including drive spring means, said drive means being operatively connected to said base and said rotatable subassembly for winding of said drive spring means by rotation of said rotatable subassembly relative to said base in one direction and for urging of said rotatable subassembly in the other direction by said drive spring means when it is wound, said drive means permitting said rotatable subassembly to rotate in the other direction without winding said drive spring means;
d. handle means including a handle portion adapted to be manually gripped by the user, said handle means being slidably mounted on said rotatable subassembly for sliding movement radially thereof from a first position, in which said handle portion is spaced farther from said axis, to a second position, in which said handle portion is positioned closer to said axis; and
e. cooperating locking means on said base and said handle means, said locking means being engageable upon movement of said handle means to said second position to prevent rotation of said rotatable subassembly relative to said base in said other direction and disengageable upon movement of said handle means to said first position to permit such rotation, whereby winding, locking, and release can all be effected by manipulation of said handle means.

8. A method of operating a centrifugal-casting machine comprising the steps of:
a. providing a centrifugal-casting machine that includes:
(i) a base;
(ii) a rotatable subassembly journaled in said base for rotation relative to said base about an axis and having mounting means thereon spaced transversely from said axis and mounting a centrifugal-casting crucible and mold;
(iii) drive means including drive spring means, said drive means being operatively connected to said base and said rotatable subassembly for winding of said drive spring means by rotation of said rotatable subassembly relative to said base in one direction and for urging of said rotatable subassembly in the other direction when said drive spring means is wound, said drive means permitting said rotatable subassembly to rotate in the other direction relative to said base without winding said drive spring means;
(iv) handle means including a handle portion adapted to be manually gripped by the user, said handle means being slidably mounted on said rotatable subassembly for sliding movement radially thereof from a first position in which said handle portion is spaced farther from said axis to a second position in which said handle portion is positioned closer to said axis; and
(v) cooperating locking means on said base and said handle means, said locking means being engageable upon movement of said handle portion to said second position to prevent rotation of said rotatable subassembly relative to said base in said other direction and disengageable upon movement of said handle means to said first position to permit such rotation, whereby winding, locking, and release of said centrifugal-casting machine are all possible by manipulation of said handle means;
b. with said handle means in said first position, urging said handle portion about said axis in said one direction, thereby winding said drive spring means;
c. moving said handle portion to said second position to engage said cooperating locking means;
d. heating a charge of material in said crucible to a molten state;
e. moving said handle portion to said first position; and
f. releasing said handle portion of said handle means, thereby permitting said drive means to rotate said rotatable subassembly.

4,273,182

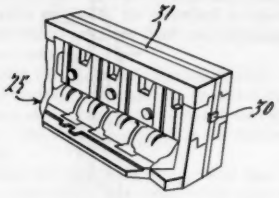
CORE ASSEMBLY AND THE METHOD OF MAKING AND USING SUCH ASSEMBLY

Donald L. Winterhalter, and Conrad G. Perkey, both of Dearborn Heights, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 7, 1979, Ser. No. 101,311
Int. Cl.³ B22C *9/10*; B22D *33/04*
U.S. Cl. 164—137 **9 Claims**

1. A method of making a metal casting, comprising:
(a) assembling for use as a unit a plurality of selectively disintegratable cores;
(b) securing said unit by at least one annular strap tightly

binding said unit, said strap consisting of a material that is dissipatible by the heat of the metal to be cast; and



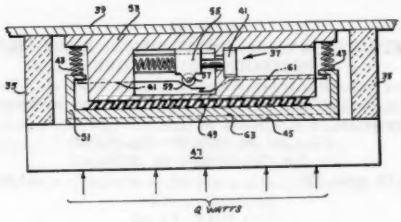
(c) placing said unit in a mold and pouring molten metal thereinto to form a casting while dissipating said strap.

4,273,183

MECHANICAL HEAT TRANSFER DEVICE

Frank E. Altoz, Catonsville, and William H. Winn, Linthicum, both of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 31, 1979, Ser. No. 62,592
Int. Cl.³ F28F *27/00*
U.S. Cl. 165—32 **2 Claims**



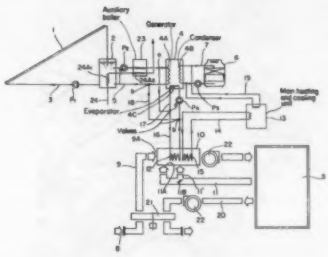
1. A unidirectional heat transfer device for use on an aircraft to cool an electronic assembly installed therein, said heat transfer device comprising a heat exchanger in surface contact with the electronic assembly, a plate assembly having one side in surface contact with said heat exchanger, interface coupling surfaces formed between said heat exchanger and said plate assembly, a flexible thermal conductor in surface contact with the other side of said plate assembly, a stationary outer conductor plate having one side in surface contact with said flexible thermal conductor, the other side of said conductor plate being in contact with the outer skin of the aircraft, a thermal actuator positioned within said outer conductor plate for sensing and reacting to the increase in temperature of the outer skin of the aircraft, said actuator being fabricated of a phase change material, an actuator piston attached to said thermal actuator for producing linear movement in response to phase change thereof, a cam roller attached to said actuator piston for movement therewith, a pair of pivoting links positioned between said cam roller and said plate assembly, a cam surface on one of said pivoting links in contact with said cam roller to cause said pivoting links to pivot in response to movement of said cam roller, the pivoting of said pivoting links producing a decoupling movement of said plate assembly to prevent heat from the outer skin of the aircraft from flowing back to the electronic assembly, a first biasing means for holding said plate assembly against the surface of the electronic assembly, and a second biasing means for urging said actuator piston back to its first position when the temperature of the outer skin of the aircraft decreases to a predetermined lower level, thereby allowing heat to flow again from the electronic assembly to the outer skin of the aircraft.

4,273,184

SOLAR HEAT UTILIZED AIR-CONDITIONING SYSTEM

Shunroku Tanaka, Tokyo; Jun Inoue, Matsubara; Katsurou Yukimachi, Sakai, and Kelichi Minamino, Matsubara, all of Japan, assignors to Osaka Gas Kabushiki Kaisha, Osaka, Japan

Filed Sep. 5, 1978, Ser. No. 939,317
Int. Cl.³ F24F *7/00*
U.S. Cl. 165—59 **2 Claims**



1. A cooling and heating system utilizing solar heat comprising;

an air-conditioning unit (**10**) disposed intermediately of a fresh-air intake path (**9**) leading to space (S) to be air conditioned, said air-conditioning unit (**10**) having a main heat exchanger (**15**) and an auxiliary heat exchanger (**12**) arranged in parallel with and adjacent to each other therein with said auxiliary heat exchanger (**12**) disposed at a fresh-air intake side thereof,

a main cooling and heating apparatus (**13**) of a type not utilizing solar heat and capable of selectively supplying cold or warm water to said main heat exchanger (**15**),

an auxiliary cooling and heating apparatus of a type utilizing solar heat and capable of selectively supplying cold or warm water to said auxiliary heat exchanger (**12**), said auxiliary cooling and heating apparatus including; a solar heat collecting unit (**1**), a regenerator tank (**2**) for storing warm water heated by solar heat obtained by said solar heat collecting unit (**1**), an absorption type refrigerating machine (**4**) for producing cold water by provoking a refrigerating cycle of evaporation-condensation-vaporization-absorption of an incorporated refrigerant using the heat of the warm water supplied from said regenerator tank (**2**), warm water circuits (**5**) (**18**) for supplying the warm water from said generator tank (**2**) selectively to said absorption type refrigerating machine (**4**) or to said auxiliary heat exchanger (**12**), and a cold water circuit (**17**) for selectively supplying or not supplying the cold water from said absorption type refrigerating machine (**4**) to said auxiliary heat exchanger (**12**),

an air return path (**11**) extended from said space to be air-conditioned (S) and being opened in and communicated with said air conditioning unit (**10**) at a portion of a fresh-air intake side with respect to said auxiliary heat exchanger (**12**), said air return path (**11**) being provided with a branched path (**11'**) opened in and communicated with said air conditioning unit (**10**) at an intermediate portion between said main and auxiliary heat exchangers (**15**), (**12**), and a damper (**11B**) to selectively open and close said branched path (**11'**), and

a further heat exchanger (**21**) disposed between said fresh-air intake path (**9**) and an exhaust path (**20**) extending from said space to be air-conditioned (S).

4,273,185

DEVICE FOR HOLDING A DISC-SHAPED SEMICONDUCTOR ELEMENT

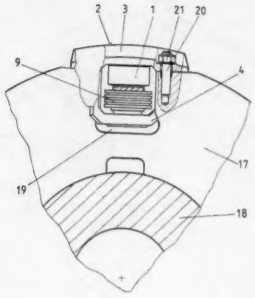
Kurt Thoma, Birr, and Urban Ulrich, Fislisbach, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Dec. 20, 1978, Ser. No. 971,543

Claims priority, application Switzerland, Jan. 17, 1978, 457/78

Int. Cl.³ H01L *23/02*; F28F *7/00*

U.S. Cl. 165—80 B **11 Claims**



1. An arrangement for holding at least one disc-shaped semiconductor element on a support wheel, comprising:

a support wheel having at least one recess on an outer circumference, said support wheel being provided on a shaft;

at least one disc-shaped semiconductor element having first and second contact surfaces;

at least one carrier, said carrier releasably receiving said at least one disc-shaped semiconductor element, with said carrier being releasably received within at least one said recess of said support wheel, said carrier including a support body and a yoke with said support body and said yoke being of unitary construction, said carrier having a first clamping surface provided on one side of the disc-shaped semiconductor element and a second clamping surface provided on another side of the disc-shaped semiconductor element; and

biasing means for urging the first and the second clamping surfaces against the contact surfaces of the disc-shaped semiconductor element.

4,273,186

WELL SAFETY VALVE SYSTEM

Joseph L. Pearce, Dallas; John H. Yonker, Carrollton, and Thomas M. Deaton, Dallas, all of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Nov. 13, 1978, Ser. No. 960,170

Int. Cl.³ E21B *34/10*

U.S. Cl. 166—72 **21 Claims**

1. A well safety system comprising:

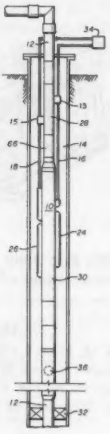
a tubing retrievable safety valve connectable in a tubing string having means for controlling flow therethrough and means responsive to pressure for opening and closing said valve;

a control line for conducting a pressure fluid to said valve;

a balance line for conducting a pressure fluid to said valve;

a landing nipple connectable in said tubing string, spaced from said tubing retrievable safety valve, for receiving a secondary safety valve;

means for connecting said control and balance lines to said landing nipple;



means for selectively conducting the pressure fluids from said lines to either the tubing retrievable safety valve or to said landing nipple.

4,273,187

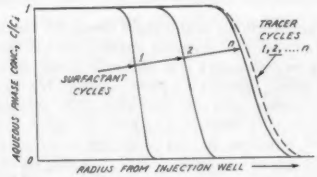
PETROLEUM RECOVERY CHEMICAL RETENTION PREDICTION TECHNIQUE

Abdus Satter; Richard H. Widmyer; Yick M. Shum, all of Houston, and Curtis E. Howard, Porter, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 30, 1979, Ser. No. 61,963

Int. Cl.³ E21B *47/00, 49/00*

U.S. Cl. 166—250 **8 Claims**



SURFACTANT AND TRACER CONCENTRATION PROFILES IN A CYCLIC TEST

1. A method for determining the amount of a chemical that is retained within a subterranean reservoir undergoing a chemical flooding operation comprising:

(a) conducting a first injection-soak-production cycle in a single well which penetrates and communicates with a portion of the reservoir with a volume of a fluid which comprises the retained chemical and a non-retained tracer material;

(b) obtaining from a produced fluids concentration profile of the tracer the reservoir volume contacted and a dispersion parameter describing the dispersion effects for a non-retained material within the reservoir;

(c) obtaining retention parameters for the retained chemical by history-matching the actual produced fluids concentration profile of the retained chemical with a simulated produced fluids concentration profile of the retained chemical for this cycle obtained from a chemical flood mathematical model of the reservoir;

(d) simulating within the chemical flood mathematical

model at least one more injection-soak-production cycle in the well utilizing a fluid of the same volume and comprising the same concentration of the retained chemical as in step (a) until such time as the simulated produced fluid concentration profile of the chemical is essentially the same as the actual produced fluid concentration profile of tracer from step (a);

(e) determining the amount of chemical retained within the contacted reservoir volume for the cyclic test by summing the amount of the chemical retained in step (a) and the amounts of the chemical retained in the simulated cycles of step (d);

(f) determining the amount of the chemical that is retained per unit volume by those portions of the reservoir undergoing the cyclic test by dividing the summed amount of chemical retained in step (e) by the reservoir volume contacted in the cyclic test from step (a); and

(g) determining the total amount of chemical retained within those portions of the reservoir as a whole that undergo the chemical flood from the information in step (f).

4,273,188

IN SITU COMBUSTION PROCESS FOR THE RECOVERY OF LIQUID CARBONACEOUS FUELS FROM SUBTERRANEAN FORMATIONS

Roger F. Vogel, Butler; Ajay M. Madgavkar, Pittsburgh, and Harold E. Swift, Gibsonia, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Apr. 30, 1980, Ser. No. 145,368

The portion of the term of this patent subsequent to Feb. 5, 1997, has been disclaimed.

Int. Cl.³ E21B *43/24*

U.S. Cl. 166—256 **19 Claims**

1. The in situ combustion process for recovering liquid hydrocarbons from subterranean formations which comprises injecting a stream of combustion air into at least one injection well leading to a combustion zone in said subterranean formation, producing liquid hydrocarbons and combustion gas from at least one production well, separating the liquid hydrocarbons from the stream of combustion gas whereby a separated stream of flue gas is obtained having a heating value between about 15 Btu/scf. and about 200 Btu/scf. and containing at least one aliphatic hydrocarbon having from one to about seven carbon atoms, passing said flue gas stream admixed with air for combustion through two combustion zones in series comprising a first combustion zone and a second combustion zone in contact with two different catalysts consisting of a supported bimetallic catalyst comprising platinum and at least one metal oxide cocatalyst selected from Groups IIA and VIIB, Group VIII up through atomic No. 45, the lanthanides, chronium, zinc, silver, tin and antimony in one combustion zone and an oxidation catalyst which does not have the carbon monoxide suppressing capability of the bimetallic catalyst in the other combustion zone at a temperature in each combustion zone which is high enough to initiate and maintain combustion of said gas stream, the total amount of combustion air being sufficient to provide an air equivalence ratio between about 0.20 and less than 1.0, expanding the gas stream in a gas turbine following said catalyzed combustion; and driving an air compressor with said gas turbine to compress and inject said stream of combustion air into the said subterranean combustion zone.

4,273,189

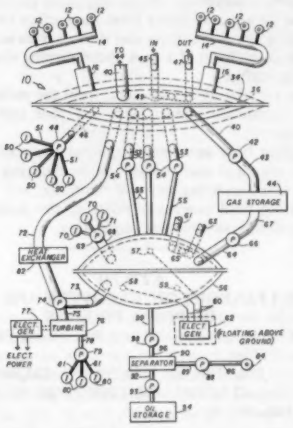
METHOD AND APPARATUS FOR RECOVERING NATURAL GAS FROM GEOPRESSURED SALT WATER

Neil L. Carpenter, 392 Englewood, Kerrville, Tex. 78028

Continuation-in-part of Ser. No. 914,879, Jun. 12, 1978, abandoned. This application Oct. 30, 1979, Ser. No. 89,287

Int. Cl.³ B01D *19/00*; C02F *1/46*; C25B *1/04*; E21B *43/40*

U.S. Cl. 166—266 **56 Claims**



1. A method of recovering hydrocarbon gases from hot geopressured salt water, comprising the steps of

recovering the geopressured salt water from a subsurface earth formation,

discharging the geopressured salt water into a variable volume container at a substantially reduced pressure for causing release of hydrocarbon gases therefrom,

agitating the geopressured salt water during said discharge step for enhancing release of the hydrocarbon gases, and

recovering the released hydrocarbon gases.

21. A method of recovering hydrocarbon gases from connate salt water associated with crude oil recovered from a producing oil well, comprising the steps of

separating the connate salt water containing dissolved hydrocarbon gases from the recovered crude oil,

electrically isolating said separated connate salt water,

establishing an AC electrical current flow in said separated connate salt water for causing disassociation of hydrocarbon gases therefrom, and

recovering said disassociated hydrocarbon gases.

4,273,190

METHOD AND APPARATUS FOR GRAVEL PACKING MULTIPLE ZONES

Eugene E. Baker; David D. Szarka, both of Duncan, Okla.; Odie R. S. Davis, Humble, and Nolan M. Workman, Lewisville, both of Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Dec. 27, 1979, Ser. No. 107,699

Int. Cl.³ E21B *43/04*

U.S. Cl. 166—278 **37 Claims**

1. Apparatus for circulating fluid to at least one formation in a well bore, comprising:

seal means to isolate said at least one formation from said well bore above said formation;

fluid passage means adapted to carry said fluid between a location substantially removed from and above said at least one formation and said at least one formation in isolation from said well bore;

circulation means in fluid communication with said fluid passage means and adapted to circulate said fluid from

said fluid passage means in one direction to said at least one formation and back to said fluid passage means, and to receive said fluid in the reverse direction from said fluid passage means and return it thereto without moving fluid in contact with said at least one formation; and

positioner means to position said circulation means adjacent said at least one formation.

30. A method of gravel-packing at least one zone pierced by a well bore, comprising:

circulating a gravel slurry from the surface to said zone;

depositing the gravel from said slurry across said at least one zone in the form of a pack and returning slurry-free fluid to the surface;

reverse circulating a clean fluid from the surface to a location proximate said at least one zone and back to the surface;

preventing fluid movement adjacent the wall of said well bore except at said at least one zone during said circulating, said depositing and said returning; and

preventing fluid movement adjacent the wall of said well bore during said reverse circulating.

4,273,191

SIMULTANEOUS OIL RECOVERY AND WASTE DISPOSAL PROCESS

Joseph R. Hradel, 6482 S. Mission Rd., Mount Pleasant, Mich. 48858

Filed Feb. 25, 1980, Ser. No. 123,940
Int. Cl.³ C10G *1/04;* E21B *43/22, 43/267*
U.S. Cl. 166—305 R **8 Claims**

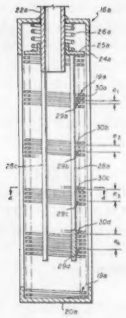
1. In a process for recovering oil from an oil bearing mass, by treating the mass with an aqueous liquid, the improvement which comprises treating said mass with a black liquor, thereby effecting the release of oil from said mass.

4,273,192

METHOD FOR CLEANING A SAND SCREEN

Fuad T. Saadeh, Bellaire, and Marc F. Fontaine, Houston, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 952,747, Oct. 19, 1978, Pat. No. 4,200,150.
This application Oct. 3, 1979, Ser. No. 81,416
Int. Cl.³ F21B *37/08, 43/08*
U.S. Cl. 166—312 **8 Claims**



1. A method for cleaning a helical spring screen having a production tube extending into the screen for producing solids-free liquid following the step of injecting a high pressure hydraulic pulse into the helical spring screen for expanding the coils of the helical spring screen comprising the step of,

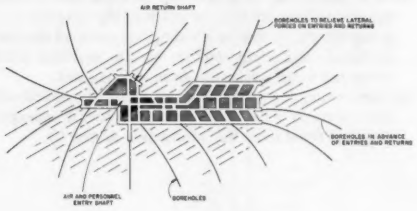
(a) urging the expanded coils toward each other after having expanded to a predetermined amount by the hydraulic pulse, by actuation of an actuator means for crushing and forcing loose the solids from between the coils for removal thereof upon subsequent spreading and cleaning of the coils.

4,273,193

PROCESS FOR USE IN DEGASIFICATION OF SUBTERRANEAN MINERAL DEPOSITS

John C. Tompkins, Oklahoma City, Okla., assignor to Kerr-McGee Coal Corporation, Oklahoma City, Okla.

Filed Feb. 8, 1980, Ser. No. 119,746
Int. Cl.³ E21B *7/08, 47/022, 43/25*
U.S. Cl. 166—314 **4 Claims**


AIR RETURN SHAFT
BOREHOLES TO RELIEVE LATERAL FORCES ON ENTRIES AND RETURNS
BOREHOLES IN ADVANCE OF ENTRIES AND RETURNS
AIR AND PERSONNEL ENTRY SHAFT
BOREHOLES

1. A process for removing gases from a subterranean mineral deposit comprising:

providing a drilling apparatus capable of producing horizontal boreholes within the subterranean deposit;

positioning said drilling apparatus within a passage within said deposit to drill a horizontal borehole in a predetermined position to effect gas removal from said deposit;

drilling a horizontal borehole by advancing a rotating drill bit from said drilling apparatus by connecting a plurality of segments of drill rod to the end of said drill bit to form a drill string while applying horizontal force produced by the drilling apparatus to the segment of drill rod nearest said drilling apparatus, said horizontal force being translated through the drill string comprising the plurality of drill rods to advance said drill bit;

providing directional guidance for said drilling through use of a continuous survey instrument positioned near the end of said drill string connected to said drill bit, said survey instrument being connected to data display devices positioned outside the borehole by an internal drill rod cable system passing through the interior of said drill string;

providing said drilling apparatus with a drilling chuck assembly which includes a rotatable drill chuck, a hollow drive shaft, operatively associated with a rotational means, said drive shaft being interposed between and connected to said drill chuck, a stationary drilling fluid adaptor fitting for introducing drilling fluid into said drill string connected to said drilling apparatus and a hollow cable support rod which extends through the interior of said rotatable drill chuck, hollow drive shaft and stationary drilling fluid adaptor fitting, said support rod having a rotating support positioned upon that end of the support rod which is within the interior of the drill chuck, said rotating support being capable of rotation with the rotation of the drill chuck while maintaining the support rod in a fixed, non-rotating position to permit said cable connecting said survey instrument to said data display devices to pass through the interior of said hollow cable support rod without being subjected to substantial rotation during rotation of said drill chuck;

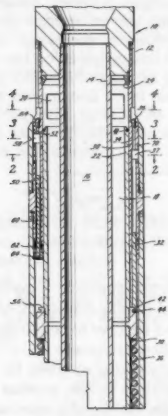
withdrawing said drill string including said survey instrument and said drill bit from the borehole upon completion of drilling to a predetermined depth; and

withdrawing gas which flows into said borehole from the surrounding mineral deposit from said borehole.

4,273,194
ANNULAR FLOW CONTROL SAFETY VALVE

Ronald E. Pringle, and Paul W. Black, both of Houston, Tex., assignors to Camco, Incorporated, Houston, Tex.

Filed Feb. 11, 1980, Ser. No. 120,439
Int. Cl.[3] E21B 43/00
U.S. Cl. 166—323 7 Claims



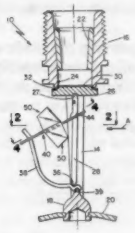
1. A well safety valve comprising,
a tubular housing
a tubular inner member connected to the housing and positioned concentrically in the housing forming an inner passageway inside of the inner member and an outer passageway between the inner member and the housing,
said housing having valve openings leading from the outer passageway to the exterior of the housing,
a tubular valve closure member telescopically movable on the interior of the housing for opening and closing said valve openings, said closure member positioned whereby upward flow through the outer passageway acts on the closure member to close said valve openings,
means for moving the valve closure member in an upward direction for closing said openings,
at least one actuating piston telescopically movable within and having its longitudinal axis within the wall of the housing and outside of the valve closure member, said piston engaging the valve closure member, the first side of the piston being in communication with a hydraulic passageway adapted to extend to the well surface for actuating said closure member in the direction to open said valve openings.

4,273,195
FIRE PROTECTION SPRINKLER HEAD WITH AIR-CURRENT DIVERTING FINS

Michael A. Fischer, North Kingstwon, R.I., and Jerome S. Pepi, North Attleboro, Mass., assignors to Grinnell Fire Protection Systems Company, Inc., Providence, R.I.

Filed Apr. 30, 1979, Ser. No. 34,636
Int. Cl.[3] A62C 37/12
U.S. Cl. 169—39 12 Claims

1. In a fire-protection sprinkler head with a fusible link, a passage in the head through which fire-retardant fluid can flow, and a closure for said passage, said link including two sheet-metal members joined at a fusible region by a fusible medium, each said member being engaged with another portion of said sprinkler head and said link being under load in its longitudinal direction and in a manner to hold said closure in position to close said passage, said members being adapted to release said load upon melting of said fusible medium to thereby release said closure to open said passage and allow flow of said fluid, the improvement wherein
said fusible link includes at least two sheet-metal fins each of which has first and second face portions oriented in different directions to enable said fins to divert air currents from a plurality of orthogonal directions over said fusible region,
said fusible region is generally planar and has two opposite generally longitudinally extending edges,
said fins extend from said edges,

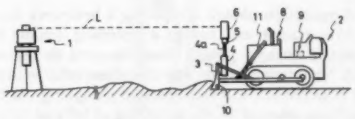


any said fin extending from the first of said edges extends away from said link in such a direction that said fin lies on one side of the plane passing through said planar region,
any said fin extending from the second of said edges extends away from said link in such a direction that said fin lies on the other side of said plane passing through said planar region,
whereby air diverted over said fusible region by the fin extending from said first edge is not retarded in moving away from said link by the fin extending from said second edge and thus heat transfer is enhanced by a continuous movement of air across said fusible region.

4,273,196
AUTOMATIC CONTROL SYSTEM FOR MAINTAINING BLADE IN PREDETERMINED RELATIONSHIP TO LASER BEAM

Yuji Etsusaki, and Shunichi Hayakawa, both of Hiratsuka, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed May 11, 1979, Ser. No. 38,318
Claims priority, application Japan, May 16, 1978, 53/57887
Int. Cl.[3] E02F 3/76, 3/85
U.S. Cl. 172—4.5 6 Claims



1. An automatic control system for maintaining the blade of an earthworking device in a predetermined vertical relationship to a reference laser beam, said system comprising:
a beam receiver coupled to the blade, said beam receiver providing a beam detection signal corresponding to a vertical position on the beam receiver at which the reference laser beam is received and to an incident angle of the reference laser beam, wherein said beam receiver includes at least two beam receiving element groups angled outwardly with respect to each other;
main control means for controlling the position of the blade in response to said beam detection signal so that the vertical position at which the laser beam is received will correspond to a preset position;
automatic tracing means for controlling the turning of the

beam receiver in response to the beam detection signal to thereby control the direction of the beam receiver, wherein said automatic tracing means comprises a logical circuit which can receive a first signal from one of said beam receiving element groups and a second signal from the other of said beam receiving element groups and delivers no output when it has received both the first and second signals, a right turn signal when it has received the first signal only and a left turn signal when it has received the second signal only;

beam deviation means for detecting an upward or downward deviation of the beam receiver with respect to the laser beam; and

blade control means for moving the blade upward when the beam receiver has deviated downwardly with respect to the laser beam and downward when the beam receiver has deviated upwardly with respect to the laser beam, to thereby enable the beam receiver to receive the laser beam again.

4,273,197

REVERSIBLE PLOUGHS

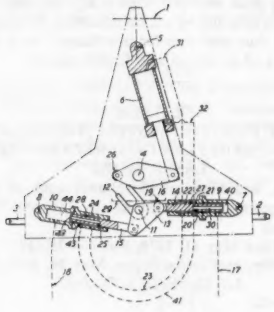
Richard J. Hawes, Ipswich, England, assignor to Nacton Works, Ipswich, England

Filed Mar. 10, 1980, Ser. No. 128,900

Claims priority, application United Kingdom, Mar. 12, 1979, 08643/79

Int. Cl.³ A01B *3/34*

U.S. Cl. 172—225 **12 Claims**



1. A reversible plough comprising a headstock for connection to a tractor and having a reversing spindle rotatably mounted therein; a plough frame secured to the reversing spindle for rotational reversing movement relative to the headstock between left and right handed ploughing positions, the frame being adapted for the mounting of left and right handed plough bodies, and a double acting hydraulic ram supported in the headstock and connected with the reversing spindle, the ram being adapted when supplied with hydraulic fluid at one end thereof to rotate the frame from one ploughing position to a midway position and when subsequently supplied with hydraulic fluid at the other end thereof to rotate the frame from the midway position to the other ploughing position, characterised in that there is provided a hydraulically operating mechanism (**9**, **10**, **14**, **15**, **13**, **12**, **26**) connected between a source of hydraulic fluid (**17**, **18**) and the double acting ram (**16**) and cooperating mechanically with the reversing spindle (**4**), the mechanism serving at the midway position of the plough frame both to switch the flow of hydraulic fluid from one to the other end of the double acting ram and to apply additional reversing torque to the spindle.

4,273,198

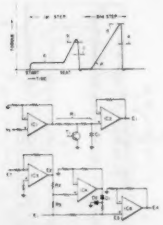
MOTOR-DRIVEN CLAMPING METHOD AND DEVICE

Tabito Doniwa, Atsugi, Japan, assignor to Daiichi Dentsu Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 9, 1979, Ser. No. 55,608

Int. Cl.³ B25B *23/147, 21/02*

U.S. Cl. 173—1 **2 Claims**



1. A motor-driven clamping method comprising the steps of:

once decelerating and rapidly stopping a drive motor when a torque applied to a member to be clamped reaches a first set value smaller than a reference set value;

re-starting immediately and controlling the drive motor so that the torque applied to the member to be clamped increases along a predetermined torque increasing characteristic; and

braking the drive motor to be rapidly stopped when the torque applied to the member to be clamped reaches a second value corresponding to the reference set value.

4,273,199

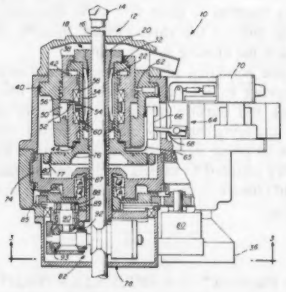
TORQUER/THRUSTER

John H. Blanz, 282 E. Riding Dr., Carlisle, Mass. 01741

Filed Oct. 6, 1978, Ser. No. 949,122

Int. Cl.³ B23Q *5/027, 5/033*

U.S. Cl. 173—149 **14 Claims**



1. A device for applying rotational torque and longitudinal thrust to a drill, said device comprising:

(a) a housing;

(b) cylindrical piston means mounted within said housing, said piston means fixed against rotational movement within said housing and constrained for limited longitudinal movement within said housing;

(c) collet means mounted within said piston means, said collet means including a collet that is longitudinally expandable and inwardly contractable, said collet configured to engage and to disengage a shaft of the drill;

(d) bladder means disposed between said piston means and said collet, said bladder means and said collet means fixed against movement with respect to one another, said blad-

der means and said collet means constrained for rotational movement within said piston means;

(e) means for longitudinally moving said piston means and for urging said bladder means against said collet, said bladder inwardly contracting and longitudinally expanding said collet, said collet captively engaging the drill shaft when contracted inwardly by said bladder means, said piston means applying longitudinal thrust to a drill shaft captively engaged by said contracted collet; and

(f) drive means operatively connected to said collet means for rotating said collet means and for applying rotational torque to the drill shaft captively engaged by said collet;

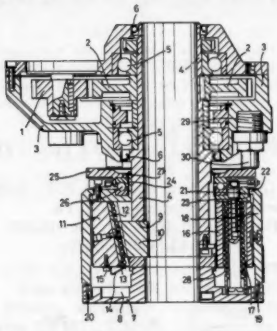
(g) said piston means, said collet means and said bladder means longitudinally movable as an integral unit, said collet means and said bladder means rotatable within said non-rotatable piston means.

4,273,200

DRIVE MANDREL FOR A DRILLING STEM

Joseph H. Lambot, Wauthier-Braine, Belgium, assignor to Diamant Boart, Brussels, Belgium

Filed Aug. 24, 1979, Ser. No. 69,410
Claims priority, application Belgium, Aug. 25, 1978, 190067
Int. Cl.³ B23B *31/30*; E21B *11/00*; E21C *9/00*
U.S. Cl. 173—166 **5 Claims**



1. A mandrel for driving a drilling stem comprising:

a fixed housing (**3**) traversed during use by the drilling stem,

transmission means (**1, 2**) mounted within the fixed housing (**3**) and mechanically coupled to a drive motor for the drilling stem,

a tubular element (**4**) coaxially traversed during use by the drilling stem, mechanically coupled to the transmission means (**1, 2**) and mounted for rotation around its axis in the fixed housing (**3**), and projecting below the fixed housing (**3**),

a circular flange (**7**) integral with the lower projection of the tubular element (**4**), and extending radially outwardly therefrom,

openings (**9**) provided in the tubular element (**4**), above the flange (**7**) and below the fixed housing (**3**) and evenly distributed around the axis of the tubular element (**4**),

an upper annular plate (**25**) surrounding the tubular element (**4**) below and close to the fixed housing (**3**), and capable of being immobilized in relation to the tubular element (**4**),

a lower annular plate (**21**) surrounding the tubular element (**4**) below the upper plate (**25**), mounted on the tubular element (**4**), axially slidable along the tubular element (**4**), and rotatable together with the tubular element (**4**),

a bearing ring (**26**) surrounding the tubular element (**4**) between the upper plate (**25**) and the lower plate (**21**) and in contact with said plates (**25**) and (**21**), axially slidable along the tubular element (**4**), and rotatable in part together with the tubular element (**4**),

a cylinder (**18**) surrounding the lower part of the tubular element (**4**) at a distance from said element, placed above the flange (**7**), threaded internally, fastened at the top to the lower plate (**21**), axially slidable along the tubular element (**4**), and rotatable together with the lower plate (**21**),

a sleeve (**16**) surrounding the lower part of the tubular element, above the flange (**7**), threaded externally, and axially screwed in an adjustable manner into the cylinder (**18**),

jaws (**10**) disposed in corresponding apertures in the sleeve (**16**), extending through the openings (**9**) of the tubular element (**4**), radially slidable in the apertures and openings (**9**), bearing in use against the drilling stem, and rotatable together with the sleeve (**16**),

wedges (**11**) supported by the sleeve (**16**), cooperating with the jaws (**10**), slidable upwardly, bearing against the lower plate (**21**), and rotatable together with the sleeve (**16**),

springs (**28**) disposed in cavities (**17**) of the sleeve (**16**) bearing at their lower sides against the flange (**7**), bearing at their upper sides against the lower plate (**21**) and biasing it upwardly, and rotatably together with the sleeve (**16**),

fixed hydraulic screw jacks (**29**) mounted on the fixed housing (**3**), evenly distributed around the axis of the tubular element (**4**), and having piston rods (**30**) bearing against the upper plate (**25**),

the assembly of the tubular element (**4**), the jaws (**10**), the wedges (**11**), the springs (**28**), the sleeve (**16**), the cylinder (**18**), the lower plate (**21**) and part of the bearing ring (**26**) thus turning around the axis of the drilling stem under the action of the drive motor of the drilling stem and by the intermediary of the transmission means, said assembly driving the drilling stem by the jaws (**10**) gripping it, and

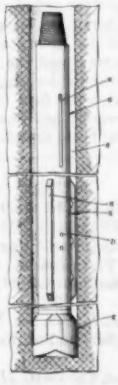
the assembly of the sleeve (**16**), the wedges (**11**), the lower plate (**21**), the bearing ring (**26**) and the upper plate (**25**) being slidable along the axis of the drilling stem, upwardly under the action of the springs (**28**) and downwardly against said springs (**28**) under the effect of the thrust of the hydraulic screw jacks (**29**), the wedges (**11**) pushing the jaws (**10**) against the drilling stem by the springs (**28**), and releasing said jaws (**10**) from the drilling stem due to the hydraulic screw jacks (**29**).

4,273,201

WELL DRILLING COLLARS

Wylie Garrett, Hammond, La., assignor to Garrett Design, Inc., Hammond, La.

Filed Mar. 31, 1980, Ser. No. 135,863
Int. Cl.³ E21B *17/16*
U.S. Cl. 175—107 **4 Claims**



1. In a drill collar for rotary drilling and which is of the type carrying a drill bit through which drilling fluid is ejected during drilling operations, said drill collar comprising:

a cylindrical body having an axial through-bore therein for conducting drilling fluid to said drill bit for ejection therefrom,

at least first and second non-radially oriented, horizontally extending passages in said body above said bit, each passage extending partially through said body and including an inner end terminating within said body adjacent said through-bore and an outer end opening into the ambient surroundings,

said first and second passages being spaced from said through-bore on opposite sides thereof,

conduit means communicating said through-bore with the inner end of each of said passages to discharge drilling fluid through each passage and horizontally from the outer ends thereof to establish horizontal moments, all of which horizontal moments act in the direction of rotation of said collar to augment such rotation,

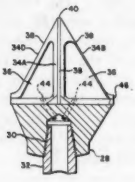
said through-bore being of reduced diameter from a location below said passages to said bit to at least partially compensate at said bit for the pressure drop caused by the discharge through said passages.

4,273,202

DRILLING BIT FOR BLAST FURNACE TAP HOLES

Paul S. Phillips, Pittsburgh, and Glenn Forsythe, Ellwood City, both of Pa., assignors to Woodings Industrial Corporation, Mars, Pa.

Filed Feb. 5, 1979, Ser. No. 8,993
Int. Cl.³ E21B *10/00*
U.S. Cl. 175—385 **5 Claims**



1. A drilling bit comprising a central, generally cylindrical body portion having an opening for receiving the end of a hollow drill rod, flanged cutting elements mounted on said cylindrical body portion and extending radially outwardly from its central axis, the cutting elements being separated by flutes and having outer inclined cutting edges which extend beyond the periphery of the cylindrical body portion at their points of connection thereto and which converge into a point at the forward end of the bit opposite the cylindrical body portion, the body portion and the cutting elements being formed from a single, integral forging, and passageways in said body portion for conveying fluid into said flutes to force drilled material backwardly and away from said bit as it is forced into the material being drilled.

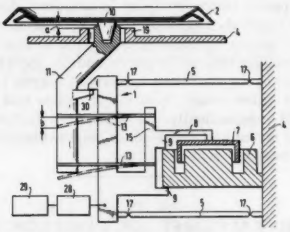
4,273,203

APPARATUS FOR OVERLOAD PROTECTION OF PRECISION SCALES

Dieter Blawert, Göttingen; Karl-Heinz Rademacher, Bovenden, and Walter Södler, Pforzheim-Büi., all of Fed. Rep. of Germany, assignors to Sartorius GmbH, Göttingen, Fed. Rep. of Germany

Filed Jul. 2, 1979, Ser. No. 53,762
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1978, 2830345
Int. Cl.³ G01G *21/10*
U.S. Cl. 177—187 **8 Claims**

1. An overload protection device for a scale having a weighing pan supported on the upper end of a parallel guided load support coupled with a transducer having limited movement, wherein auxiliary parallel guide means is connected between the weighing pan and load support, said auxiliary parallel guide means including a pre-biased resilient element connected between the weighing pan and load support and having a spring path which is greater than the free travel of the weighing pan



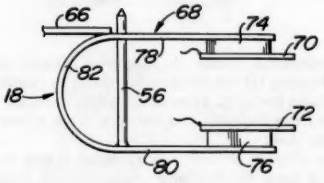
up to a stop, said resilient element coupling the weighing pan with the load support in a semi-rigid manner for movement together under proper load conditions and in an elastically yielding manner under improper load conditions, said auxiliary parallel guide means comprising the resilient element.

4,273,204

CAPACITIVE FORCE LOAD CELL FOR WEIGHING SCALE

Adelbert M. Gillen, Atlantic Highlands, N.J., assignor to The Jade Corporation, Huntingdon Valley, Pa.

Filed May 30, 1978, Ser. No. 910,804
Int. Cl.³ G01G *7/00*
U.S. Cl. 177—210 C **14 Claims**



1. A capacitive force load cell for linearly transducing force into electrical capacity, comprising:

(a) a pair of metallic plates;

(b) said plates being insulatively mounted on a support to form a capacitor;

(c) said support including arm means supporting one end of said plates so that at least one of said plates has a free distal end, said arm means being joined to spring means holding said plates in their initial spaced relation to each other;

(d) means for transmitting a load force proportional to weight to said support for changing the spacing between facing surfaces of said plates with maximum change of spacing being at said distal end of at least one plate in response to the applied force thereby changing the electrical capacity of the capacitor formed by said plate;

(e) said plates having a physical shape such that the change in electrical capacitance is linearly proportional to the load force applied to the support when the facing surfaces of the plates are displaced out of their initial spaced relation by the force applied to the support.

4,273,205
CLAMPING DEVICE FOR OSCILLATORY STRINGS IN A WEIGHT SENSING CELL FOR A WEIGHING APPARATUS

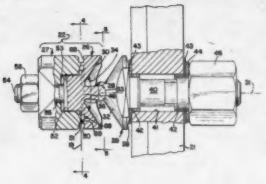
Albert H. De Voogd, Venlo, Netherlands, assignor to Maatschappij van Berkel's Patent N.V., Leidschendam, Netherlands

Filed Feb. 28, 1980, Ser. No. 125,490

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1979, 2908110

Int. Cl.³ G01G *3/14*; G10D *3/00*

U.S. Cl. 177—210 FP **7 Claims**



1. In a weight sensing cell for a weighing apparatus having a vibrating string, a clamping device mounted on a fixed or movable support of the apparatus for securing thereto an end of the string which comprises, a base adjacent to the support, a flexurally and/or torsionally resilient neck extending from the base along an axis perpendicular to the string, and a clamping head on the free end of the neck, said clamping head including jaws for clamping the end of the string and having a recess facing the neck and into which the neck extends such that the clamping point of the jaws is substantially aligned with the bottom of the recess where the neck is joined.

4,273,206
TORQUE CONVERTER

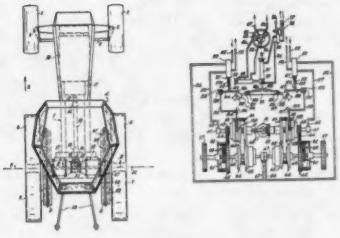
Cornelis van der Lely, 7 Brüschenrain, Zug, Switzerland

Filed Dec. 15, 1978, Ser. No. 969,703

Claims priority, application Netherlands, Dec. 15, 1977, 7713880; Dec. 15, 1977, 7713881

Int. Cl.³ B62D *11/08*

U.S. Cl. 180—6 Z **12 Claims**



1. A motor vehicle having forward steerable wheels and rear wheels, a motor being in driving engagement with a respective rear wheel axle at each side of the vehicle and a steering control wheel connected to turn the steerable wheels, each axle being driven by the output of a corresponding torque converter, said converter including an input shaft that is rotated by the motor and a change-speed mechanism that interconnects the input and output shafts, said mechanism being adjusted hydraulically responsive to a speed control and/or said control wheel, a hydraulic system comprising corresponding valve means for each converter that feeds and withdraws pressurized fluid to said converter and said valve means being actuated by a control device to supply fluid selectively to the two mechanisms, said axles each being rotated in either direction of rotation by the corresponding mechanism.

4,273,207
SUPPORTING PIPE TO CONSTITUTE A DRIVE UNIT FOR AN AUTOMOTIVE VEHICLE

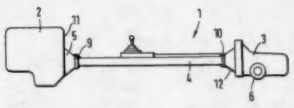
Rolf V. Sivers, Warmbronn; Rudolf Herrmann, Flein, and Ulrich Layher, Sersheim, all of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Sep. 5, 1979, Ser. No. 72,608

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1978, 2838574

Int. Cl.³ B60K *17/22*

U.S. Cl. 180—70 P **22 Claims**



1. A drive unit for an automotive vehicle, comprising an engine with a clutch and a transmission unit, the engine being disposed forwardly of the transmission and connected to the transmission to form a unit by an interposed supporting pipe, the supporting pipe comprising at least one outer pipe and an inner pipe fitted therein, said pipes being fixedly interconnected only at one end and except for said one end being held together in a manner permitting relative movement by a friction seating of the inner pipe within the outer pipe.

4,273,208
SYSTEM FOR CONTROLLING THE SPEED OF AN AUTOMOTIVE VEHICLE

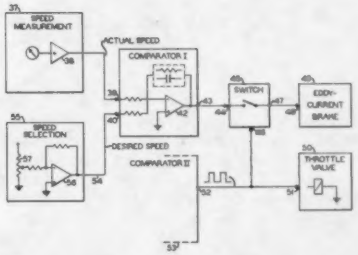
Peter Liermann, Gehrden, Fed. Rep. of Germany, assignor to WABCO Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Apr. 30, 1979, Ser. No. 34,535

Claims priority, application Fed. Rep. of Germany, May 2, 1978, 2819175

Int. Cl.³ B60K *31/00*

U.S. Cl. 180—179 **4 Claims**



1. A system for controlling the speed of a vehicle, which is provided with service brake apparatus and a plurality of other deceleration devices for reducing vehicle speed, comprising,

(a) a speed measuring means responsive to vehicle movement for supplying a first signal representing actual vehicle speed,

(b) a source supplying a second signal representing desired vehicle speed,

(c) a comparator means having a plurality of channels, each channel associated with a different one of said other deceleration devices and coupled to said speed measuring means and said desired speed source for comparing said first and second signals, said channels generating separate output signals at different preselected levels of difference between said first and second signals,

(d) a first comparator channel being coupled for actuating a first other decelerating device when an output signal is produced at the lowest of said preselected difference levels to provide an initial level of additional deceleration of said vehicle,

(e) a separate switch means coupled between the second and each higher numbered comparator channel and the associated other deceleration device, and enabled by an output signal from the next lower numbered channel for supplying an output signal from the associated channel to the associated other deceleration device to actuate increasing additional deceleration of said vehicle as successive preselected higher levels of difference between actual and selected speed signals are exceeded.

4,273,209

POWER TRANSMITTING DEVICE AND APPLICATIONS THEREOF

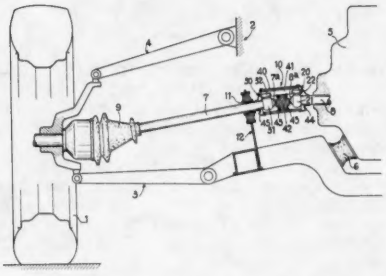
Michel A. Orain, Conflans Ste Honorine, France, assignor to Glaenzer Spicer, Poissy, France

Filed Feb. 13, 1979, Ser. No. 11,870

Claims priority, application France, Feb. 13, 1978, 78 03978; Apr. 26, 1978, 78 12335

Int. Cl.³ F16D *3/02*

U.S. Cl. 180—254 **18 Claims**



1. A homokinetic transmission device interposed between and combined with a driving member and a driven member comprising two adjacent articulated joints combined with a common intermediate member and together homokinetic, each of which joints comprising an element defining trunnions and rollers which are respectively mounted on the trunnions by means of needle bearings, at least one of the joints being slidable, the two articulated joints being so arranged as to permit a relative radial displacement between the driving member and driven member and, if h and l are the respective distances between centres of the two two adjacent articulated joints and a centre of gravity of the transmission device for interconnecting the driving member and driven members, and ρ^2 is equal to Io/m where Io represents the inertia of the intermediate member about an axis perpendicular to the general axis of the intermediate member and to a direction of lateral displacement of said intermediate member and intersecting the centre of gravity G and m represents the mass of the intermediate member, the following condition is at least substantially satisfied:

$$h \times l = \rho^2.$$

4,273,210

ROLLER UNIT FOR WINDING-UP SAFETY BELTS FOR MOTOR VEHICLES

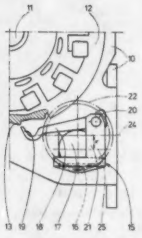
Karl-Heinz Nitzbon, Hamburg, Fed. Rep. of Germany, assignor to Autoflug GmbH, Rellingen, Fed. Rep. of Germany

Continuation of Ser. No. 920,285, Jun. 29, 1979, abandoned. This application Nov. 23, 1979, Ser. No. 96,886

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1977, 2729301

Int. Cl.³ A62B *35/02;* **B65H** *75/48*

U.S. Cl. 180—268 **5 Claims**



5. A roller unit for winding up a safety belt for motor vehicles with a built-in device for blocking the pulling-out of the safety belt in response to certain movements and positions of a vehicle equipped with said unit, said device including in combination:

a sensor comprising a magnetically attractible ball resting in a saucer,

rotatable means for winding up a safety belt,

a blocking disc rotatably connected to said rotatable means, ratchet gear means connected to said blocking disc for rotation therewith,

pawl means resting on said ball and operable to engage and disengage said ratchet gear means upon upward movement, said pawl means being operable by said ball upon upward movement in said saucer to move from an ineffective position in which it is disengaged from said ratchet gear means into an effective position in which it engages said ratchet gear means and thereby blocks rotation of said blocking disc and said rotatable means, and

an electromagnet with a coil arranged in minimum space to said ball in said saucer, said coil being operable when energized to exert an attractive force directly upon said ball to cause the latter to move upwardly in said saucer to positively move said pawl means upwardly into engagement with said ratchet gear means, thereby causing blockage of said rotatable means, the axis of the coil of said electromagnet being spaced upwardly from the axis of said ball which passes through the center of gravity of said ball and parallel to said axis of the coil so that electromagnet forces are effective in a direction corresponding to ball movement in said saucer substantially parallel to said coil axis by a distance necessary to cause said ball to move said pawl means into its effective position.

4,273,211

FIXED PIVOT SINGLE PEDAL ACCELERATOR AND BRAKE CONTROL MECHANISM

Alberto G. Sarmiento, Box 305, Mayaguez, P.R. 00708

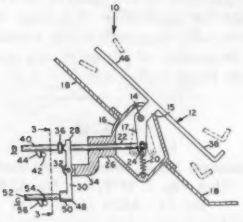
Continuation of Ser. No. 824,813, Aug. 15, 1977, abandoned. This application Apr. 6, 1979, Ser. No. 27,688

Int. Cl.³ B60K *26/02*

U.S. Cl. 180—333 **5 Claims**

1. In a vehicle having an accelerator control rod and a brake

control rod extending generally parallel to each other and trasversely spaced and terminating freely at one end, a fixed pivot single pedal accelerator and brake control mechanism comprising a pivot base secured to the floor of said motor behicle, a pedal pivot fixedly mounted on said base, a combined accelerator and brake control pedal provided with a depending pivot arm intermediate its ends, pivotally mounted on said pedal pivot said pedal having an upper portion extending to one side of said pivot and also having a lower portion extending to the other side of said pivot, said pivot arm having an extension extending beyond said pedal pivot, a bar slidably mounted through a bore in said base, said pedal pivot arm



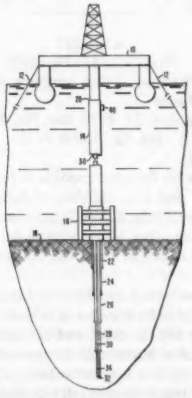
extension being operatively connected to one end of said slidably mounted bar, a see-saw rod having one bifurcated end and pivotally mounted intermediate its ends on an extension of said base and spaced from one end of said bore, said slidably mounted rod extending through said bifurcated end of said see-saw rod and terminating in an enlarged foot in alignment with the brake control rod for brake operation only when the lower portion of said pedal is depressed, said enlarged foot providing a hook pulling the bifurcated end of said see-saw rod to rock about its pivot to actuate its other end against the accelerator control rod to actuate same only when the upper portion of said pedal is depressed.

4,273,212

OIL AND GAS WELL KICK DETECTOR

John A. Dorr, and Matt Nomm, both of Annapolis, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 26, 1979, Ser. No. 6,832
Int. Cl.³ G01V *1/40*
U.S. Cl. 181—102 **7 Claims**



1. Apparatus for detecting a kick during the drilling of a well utilizing drill pipe extending down through a larger diameter conduit and wherein drilling fluid is circulated down the drill pipe and up the annulus around the drill pipe, comprising:

(A) transducer means connected to said conduit and being in acoustic communication with said drilling fluid in said annulus;

(B) means for energizing said transducer means to propagate acoustic signals through said drilling fluid down said annulus;

(C) means for receiving reflected acoustic energy propagated back through said drilling fluid; and

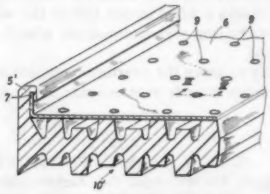
(D) means for displaying at least the reflection of acoustic energy from the vicinity of the bottom of the hole being drilled and for displaying the reflection of acoustic energy from the interface between said drilling fluid and a kicking medium.

4,273,213

ELEMENT FOR SONIC AND VIBRATORY ABSORPTION

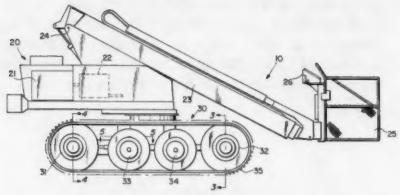
Erich Munz, Weststrasse 11, 5204 Lohmar 1, Geber, Fed. Rep. of Germany

Filed Nov. 7, 1978, Ser. No. 958,403
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1977, 2750122
Int. Cl.³ F16F *7/00*
U.S. Cl. 181—207 **2 Claims**



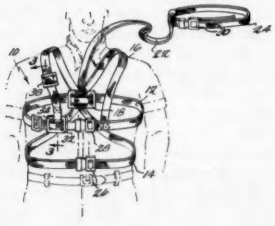
1. An element for sonic and vibratory absorption, comprising a first series of longitudinal ribs of flexible material, the ribs being of substantially uniform height and approximately trapezoidal cross section, the ribs extending substantially equidistantly and parallel to each other over the entire length of the element and projecting from the top side and the bottom side of the element, the top side and bottom side ribs being in staggered relationship and each two ribs defining a space therebetween, and a second series of longitudinal ribs of a height inferior to that of the ribs of the first series and of approximately trapezoidal cross section, each rib of inferior height being arranged in a respective one of said spaces, each rib of inferior height projecting from the top side being in alignment with a respective rib of the first series projecting from the bottom side and each rib of inferior height projecting from the bottom side being in alignment with a respective rib of the first series projecting from the top side, said element further comprising a stop extending over the entire length of the element at least at one longitudinal side of the element and a rigid support fixedly arranged on the ribs of the first series projecting from the top side, said rigid support comprising a stop ledge projecting perpendicularly to the support and parallel to the stop and having an upper rim embedded in the stop and wherein said rigid support has a planar base plate defining an array of openings gripping the ribs of the first series projecting from the top side, said ribs having buffer portions extending above the rigid support and projecting from the openings.

4,273,214
TRACK MOUNTED AERIAL LIFT PLATFORM APPARATUS
John L. Grove, Greencastle, Pa., assignor to JLG Industries, Inc., McConnellsburg, Pa.
Filed Feb. 28, 1977, Ser. No. 772,812
Int. Cl.³ B66F *11/04*
U.S. Cl. 182—2 **12 Claims**



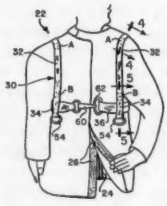
1. Aerial lift platform apparatus comprising a chassis and a rotatable upper works mounted thereon,
said upper works comprising a boom,
said boom having an operator's platform adjacent the outer end thereof,
said chassis comprising on each side first and second end wheels and at least one intermediate wheel, at least one end wheel being a driving wheel, means mounting said end wheels on said chassis,
said wheels each including a pneumatic tire, a track on said wheels,
means for mounting the intermediate wheels on opposite sides of the chassis as a pair for conjoint movement when the chassis is tilted to one side or the other, and resilient means biasing said intermediate wheels away from said chassis,
whereby to lessen the overturning moment occurring when the boom extends over one side of the apparatus.

4,273,215
SAFETY HARNESS FOR HUNTERS
Paul Leggett, 914 Woodville Dr., Jackson, Miss. 39212
Filed Nov. 29, 1978, Ser. No. 964,785
Int. Cl.³ A62B *35/00*
U.S. Cl. 182—3 **16 Claims**



1. A safety harness for maintaining a subject proximate an object comprising:
a chest web for surrounding the subject's chest;
a waist web for surrounding the subject's waist;
rear connecting means for slidably engaging said chest web and waist web;
a shoulder web having a first end attached to said chest web and a second end, said rear connecting means slidably engaging said shoulder web;
shoulder web connecting means, engaging said chest web, for connecting said shoulder web second end to said chest web,
means, engaging said shoulder web, for adjusting the length of said shoulder web;
chest connecting means, including means for adjusting the length of said chest web and a first quick release buckle, for detachably securing said chest web snugly about the chest of said subject;
waist connecting means, including means for adjusting the length of said waist web and a second quick release buckle, for detachably securing said waist web snugly about the waist of said subject;
a lifeline web having a first end and a second end, said first end having means for attachment to said rear connecting means;
said first and second buckles being of the kind which release only upon the application of a force thereto of given magnitude, said magnitude being substantially independent of the amount of tension in said waist web and said chest web, respectively.

4,273,216
SAFETY JACKET
Rita H. Weissmann, 200 E. 64th St., New York, N.Y. 10021
Filed Aug. 2, 1979, Ser. No. 62,917
Int. Cl.³ A62B *35/00, 1/16*
U.S. Cl. 182—3 **10 Claims**



1. A safety jacket adapted to have a line secured thereto for anchoring the wearer of said jacket, comprising,
(a) a harness having a pair of shoulder straps and a belt made of webbing,
(b) each of said shoulder straps being permanently affixed to the outer side of said jacket at at least one point of attachment,
(c) said shoulder straps having loops through which said belt is threaded, and
(d) said belt being permanently affixed to the outer side of said jacket at at least one point of attachment.

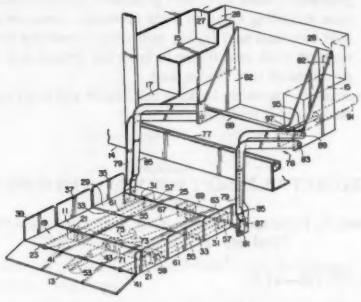
4,273,217
WHEELCHAIR LIFT
Tosifumi Kajita, Yamato, Japan, assignor to Marubeni Kogyo K.K., Gunma, Japan
Filed Jun. 13, 1979, Ser. No. 48,264
Int. Cl.³ B66B *9/20*
U.S. Cl. 187—9 R **3 Claims**

1. A wheelchair lift for a bus capable of forming stairs for the passenger to use and also capable of forming a lift for the handicapped passenger in a wheelchair, including:
a first connecting plate, a first step plate, a second connecting plate and a second step plate connected together with hinges;
a supporter connected to the first connecting plate with hinges, a set of links one end of which being connected to the supporter and the other end of which being connected to one end of a horizontal device with a set of pivots positioned in such a way as to form a parallelogram, the other end of the horizontal device being connected to a hinge of the second step plate, the supporter being connected to one end of a set of lifting links, and the other end of the set of lifting links being connected to brackets, a

shaft also connects the brackets, an arm mounted on one end of the shafts;

a set of stairs for holding both ends of the first and second step plates and which are fixed to the bus;

a first power supplying device for forming the lift when actuated, one end of said first power supplying device



being pivotally connected to the supporter the other end of which being pivotally connected to the horizontal device; and

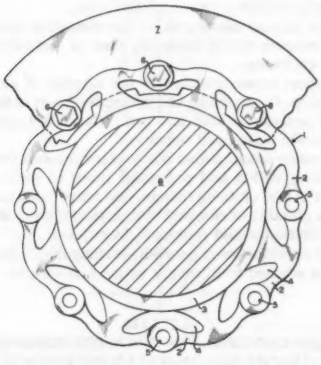
a second power supplying device for lowering and lifting the lift, one end of said second power supplying device being pivotally connected to a part of the bus and the other end of which being pivotally connected to the arm.

4,273,218

FLEXIBLE MOUNTING HUB FOR DISC MEMBER

Robert B. Morris, N. Huntingdon, and Allen W. Kyllonen, Plum, both of Pa., assignors to American Standard Inc., Wilmerding, Pa.

Filed Mar. 15, 1979, Ser. No. 20,565
Int. Cl.³ F16D *65/10*
U.S. Cl. 188—18 A **5 Claims**



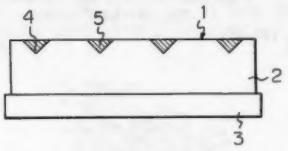
1. A hub for mounting a disc brake rotor to a flange member on a vehicle axle, said hub having a plurality of equi-angularly spaced peripheral segments each having a bolt hole formed therein for receiving a plurality of axially aligned bolts by which the rotor is concentrically secured to the hub, said hub being provided with respective opening means radially disposed between each of said peripheral segments and said flange member for allowing radial movement of said segments for accommodating expansion and contraction of the rotor caused by heat generated during braking operations.

4,273,219

FRICTION PAD OF DISC BRAKE

Hiroshi Ito, Kawasaki, Japan, assignor to Tokico Ltd., Kawasaki, Japan

Filed Aug. 10, 1979, Ser. No. 65,743
Claims priority, application Japan, Aug. 19, 1978, 53/114007[U]
Int. Cl.³ F16D *69/02*
U.S. Cl. 188—256 **5 Claims**



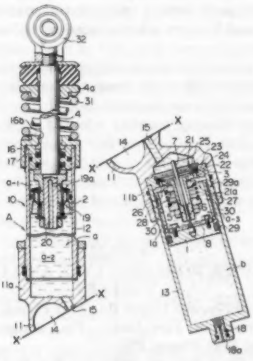
1. A friction pad for use in disc brakes, said friction pad being made of a sintered metal and having a working surface for contacting a disc and further having a plurality of shallow recesses in said working surface, and a resin filling said recesses.

4,273,220

OLEO DAMPERS HAVING VARIABLE ORIFICES

Lucien Tilkens, Zolder, Belgium, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

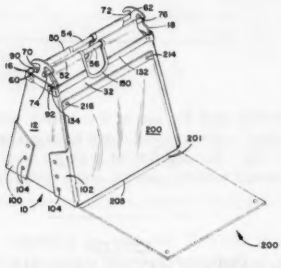
Filed Jul. 16, 1979, Ser. No. 58,065
Claims priority, application Japan, Jul. 20, 1978, 53/88883
Int. Cl.³ F16F *9/50*
U.S. Cl. 188—282 **7 Claims**



1. An oleo damper comprising housing means having inside chamber means, movable partition means separating the chamber means into oil compartment means and gas compartment means being chargeable with pressurized gas and said oil compartment means with hydraulic oil, at least a part of said oil compartment means being defined by cylinder means for reciprocating movement and having restricted passage means for allowing restricted flow of the hydraulic oil across the piston means in response to the reciprocating movement of the piston means, said piston means being provided with piston rod means extending outwardly through the housing means, stationary partition means disposed in said oil compartment means between said piston means and said movable partition means and having orifice means, said movable partition means having metering needle means extending toward said stationary partition means and inserted into said orifice means, said needle means having cross-sectional area which decreases toward said movable partition means whereby the orifice means is de-

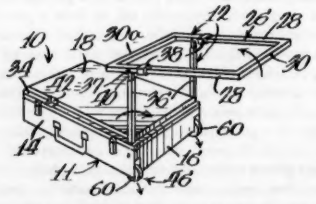
creased in effective area when the movable partition means is displaced away from the stationary partition means by increase in temperature of the oil which causes increase in the oil volume and therefore enlargement of said oil compartment, and of axial shock.

4,273,221
COMBINATION VALISE AND BACKREST
Mary K. Poag, 1686 Labrador Dr., Costa Mesa, Calif. 92626
Filed Dec. 27, 1977, Ser. No. 864,682
Int. Cl.[3] A45F *4/00*
U.S. Cl. 190—8 **19 Claims**



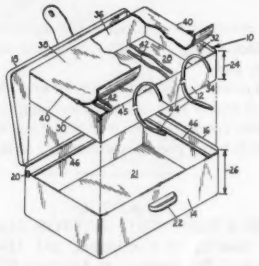
1. The combination of a valise and backrest comprising:
a pair of end panels having a base portion longer than an upper portion and wherein said base portion extends beyond the upper portion to form a stabilized base for purposes of leaning thereagainst;
a bottom interconnecting said end panels;
a pair of side panels adapted for connection to said end panels so as to form a valise out of said end panels, side panels and bottom when placed in connection relationship;
a sheet in connected relationship to said bottom upon which one can sit while at the same time leaning back against a side panel adjacent thereto; and,
at least one bracing member adapted for extending across the top portion of at least one of said end panels for connection to at least one of said side panels for purposes of supporting at least one of said side panels at the upper portions thereof between said end panels.

4,273,222
COMBINED PORTABLE CASE AND LUGGAGE TROLLEY
K. A. I. Cassimally, 402 Hayes Rd., Fort Pierce, Fla. 33450, and Horace Frommelt, Fort Pierce, Fla., assignors to K. A. I. Cassimally, Fort Pierce, Fla.
Filed Aug. 22, 1979, Ser. No. 68,867
Int. Cl.[3] A45C *5/14*
U.S. Cl. 190—18 A **20 Claims**



1. A portable case having a folding framework which is associated with a face of said case to provide the appearance of a conventional case and which can be moved to an operative position for moving said case on wheels associated therewith comprising:
a rigid rectangular frame having rigidly interconnected side and end members and substantially the same length and width as said face to be of a size to have said hollow frame lie adjacent said face when folded;
means mounting said frame for movement to an operative position spaced from and generally perpendicular to said case including a pair of arms pivotally connected between said case and said frame, said arms extending in coplanar relation with said frame in both the folded and operative positions of said frame; and
means for releasably locking said frame and arms together in said parallel relation.

4,273,223
PROTECTIVE INSERT FOR USE WITH SOFT-SIDED LUGGAGE
Lenore E. Tomlinson, 236 SE. 32nd Ave., Portland, Oreg. 97214
Filed Sep. 24, 1979, Ser. No. 78,561
Int. Cl.[3] A45C *5/12*
U.S. Cl. 190—41 C **1 Claim**

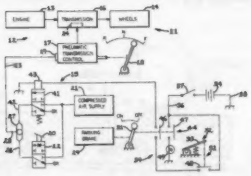


1. A protective insert for separately enclosing articles of clothing and the like within a suitcase, comprising:
(a) a selectively closable flexible envelope having a bottom member, sides attached to said bottom member and a top member attached to one of said sides;
(b) slide fastener closure means for releasably fastening said top member to the remaining ones of said sides to close said enclosure;
(c) support means attached to the exterior of said flexible envelope for attaching said protective insert to the interior of a suitcase to hold said protective insert substantially immobile within said suitcase;
(d) retention means within said protective insert for securing clothing within said protective insert to prevent movement of said clothing therein, said retention means including a plurality of elongate flexible clothing ties attached to the interior of said protective insert; and
(e) said envelope being generally rectangular in shape and of a size adapted to fit snugly within said suitcase.

4,273,224
VEHICLE CONTROL SYSTEM WITH CONDITIONAL TRANSMISSION-BRAKE INTERLOCK
Vaikai K. Brown, LeRoy Township, Lake County; Thorolf R. Bjorksten, Mentor, and Llewellyn L. Walter, Perry, all of Ohio, assignors to Towmotor Corporation, Mentor, Ohio
Filed Oct. 11, 1978, Ser. No. 950,338
Int. Cl.[3] B60K *41/26*
U.S. Cl. 192—4 A **9 Claims**

1. In a control system for a vehicle (**12**, **12*a***) having a drive transmission (**16**, **16*a***) which may be shifted between a neutral non-drive transmitting condition and at least one drive transmitting condition and having a brake (**29**, **29*a***) which may be engaged and disengaged, and having a control element (**32**,

32*a*) which is operated in conjunction with initiating travel of the vehicle, the control system including neutralizing means (**19**, **19***a*) for maintaining said transmission in said neutral condition in response to a neutralizing signal and further including a transmission and brake interlock circuit means (**39**, **39***a*) for holding said transmission in said neutral condition by transmitting said neutralizing signal to said neutralizing means if said



control element is operated while said brake is engaged, the improvement comprising:

interlock control circuit means (**51**, **51***a*) for inactivating said interlock circuit means during travel of said vehicle by blocking transmission of said neutralizing signal from said interlock circuit means to said neutralizing means to enable engagement of said brake without neutralization of said transmission when said vehicle is traveling.

4,273,225

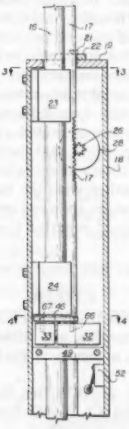
ELECTRICALLY OPERATED MAST FOR LASER-CONTROLLED LEVELLING SYSTEM

Carl R. Swanson, 204 S. "A" St., Tulare, Calif. 93274

Filed Apr. 10, 1979, Ser. No. 28,669

Int. Cl.[3] **B60K** *41/20*

U.S. Cl. 192—7 **7 Claims**



1. A mast construction for a laser sensor comprising a casing, a shaft substantially vertically reciprocable in said casing and adapted for attachment of a laser sensor on its upper end, mounting means on said casing for said shaft, a rack on said shaft, a pinion rotatably mounted in said casing meshing with said rack, means for rotating said pinion in both directions to raise and lower said shaft and a brake in said casing engageable with said shaft and arranged to impose a drag on the descent of said shaft, said brake comprising first means and second means releasably movable with said shaft having an operative position with said first and second means engaging said shaft and an inoperative position, biasing means biasing said first and second means toward operative position and brake actuating means operable to overcome said biasing means and move said first and second means to inoperative position when said shaft is being raised by said pinion.

4,273,226

ELECTROMAGNETIC SPRING-WOUND CLUTCH

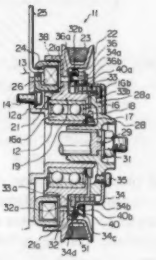
Hideyasu Takefuta; Akira Shinoda, and Teruyoshi Shibauta, all of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Jun. 8, 1979, Ser. No. 46,751

Claims priority, application Japan, Jun. 12, 1978, 53-79197

Int. Cl.[3] **F16D** *13/62, 27/10, 27/14*

U.S. Cl. 192—35 **3 Claims**



1. An electromagnetic spring-wound clutch comprising:

a rotary input member;

a rotary output member coaxial with the input member;

a rotary clutch disc coaxial with the input member and frictionally engageable therewith;

a coil-wound spring wound around the input member and being connected at its ends to the clutch disc and the output member respectively;

a cover member fixed to the output member and covering the coil-wound spring;

spring means urging the clutch disc away from engagement with the input member and toward engagement with the cover member;

an electromagnetic coil which, when energized, attracts the clutch disc into frictional engagement with the input member against a force of the spring means; and

a non-magnetic, resilient spacer disposed between the clutch disc and the cover member;

a surface of the clutch disc facing the cover member being formed with a plurality of circumferentially spaced grooves, the spacer comprising a plurality of spacer sections fittingly retained in the grooves respectively.

4,273,227

TORQUE-TRANSMITTING DEVICES

John C. Grey, 30 Osterley Ct., Osterley, Middlesex, TW7 4PX, England

Filed Nov. 29, 1979, Ser. No. 98,677

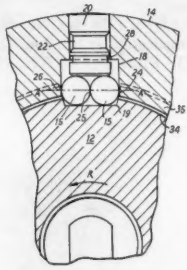
Claims priority, application United Kingdom, Dec. 4, 1978, 47080/78; Dec. 4, 1978, 47081/78

Int. Cl.[3] **F16D** *43/20*

U.S. Cl. 192—56 R **14 Claims**

1. A torque-transmitting device comprising rotary input and output members having a common axis of rotation, at least one pair of cylindrical rolling elements in coupling engagement with the members for transmitting a torque load between the input and output members while co-rotating therewith, said at least one pair of rolling elements having respective rolling axes parallel to the axis of rotation of the members and at a common radial distance from the axis of rotation, said element comprising a front element and a rear element arranged in tandem to each other so that the torque load is transmitted through said elements from the rear element to the front element, a portion of the input member comprising an engagement face having a

linear contact zone along the axial length of the rear element of said at least one pair of elements to transmit the torque load thereto and a portion of the output member comprising an engagement face having a linear contact zone along the axial length of the front element of said at least one pair of elements to receive the torque load transmitted therethrough, at least one of said contact zones for said at least one pair of elements



being on a radial plane of said one element that is obliquely offset from said common radial distance, whereby the transmission of the torque load generates a force component radially of the axis of rotation of the members to produce counter-rotary movements of the elements urging them to roll in said radial direction, resiliently displaceable means acting on said at least one element for retaining the elements in coupling engagement with the members.

4,273,228

FRICTION CLUTCH

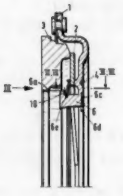
Lothar Huber, Bühl, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau GmbH, Bül, Fed. Rep. of Germany

Filed Apr. 3, 1978, Ser. No. 892,924

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1977, 2714861

Int. Cl.³ F16D *13/44*

U.S. Cl. 192—89 B **20 Claims**



1. In a friction clutch wherein, for pivotally mounting a plate spring thereof at a clutch cover, the plate spring being formed with recesses, first bracing means are provided at the cover side of the plate spring and second bracing means are provided at the side of the plate spring facing away from the clutch cover and holding means for retaining the second bracing means, said holding means being punched out of the material of the clutch cover and bent away so as to extend through the recesses formed in the plate spring, said holding means being formed from the cover by a punched-out section originally extending in a direction substantially transverse to radial direction of the cover, said punched-out section being diverted so as to extend in a substantially radial plane and substantially perpendicularly to the plane of rotation of the clutch.

4,273,229

ELASTIC MOUNTING FOR HIGH-SPEED ROTOR

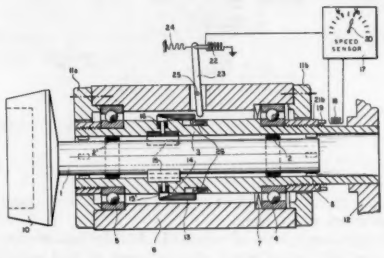
Horst Voll, Hassfurt, Fed. Rep. of Germany, assignor to Kugelfischer Georg Schäfer & Co., Schweinfurt, Fed. Rep. of Germany

Filed May 17, 1979, Ser. No. 39,779

Claims priority, application Fed. Rep. of Germany, May 20, 1978, 2822108

Int. Cl.³ F16D *43/24*

U.S. Cl. 192—105 CF **8 Claims**



1. In a device including a housing, a shaft rotatable in said housing at a high operating speed, a tool carried on a free end of said shaft projecting from said housing, and drive means for rotating said shaft,

the combination therewith of a mounting for said shaft comprising:

an elongate tubular element having an axial bore of a diameter substantially exceeding that of said shaft, said element surrounding said shaft over a major part of the length of the latter and terminating ahead of said free end thereof;

two axially spaced bearings rotatably supporting said element in said housing, said element having an extremity opposite said free end projecting from said housing, said extremity being coupled to said drive means; and

elastic coupling means in said bore supporting said shaft in substantially coaxial relationship with said element at a plurality of axially spaced locations for joint rotation while allowing limited radial excursions of said shaft from a coaxial position, said shaft and said tool together constituting a rotary body whose moment of inertia determines together with the modulus of elasticity of said coupling means a normal critical speed lower than the operating speed imparted to said body by said drive means.

4,273,230

INDEXING DRIVE DISCONNECT

Peter H. Gundal, Centerville, and Richard Briggs, East Sandwich, both of Mass., assignors to Packaging Industries, Inc., Hyannis, Mass.

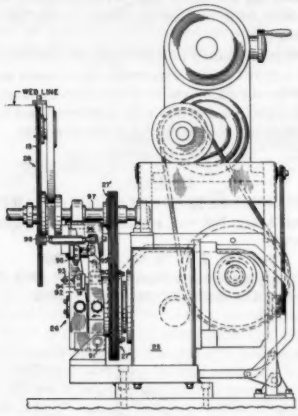
Filed Nov. 24, 1978, Ser. No. 963,427

Int. Cl.³ F16D *7/04*

U.S. Cl. 192—150 **8 Claims**

1. A rotary disconnect assembly for disconnecting a rotary drive from a driven rotary member, the disconnect assembly including a shaft adapted to be rotated, means defining a driven surface supported on the shaft to be rotated with said shaft, at least one tapered recess formed in said surface, a disconnect member mounted on said shaft and slideably supported thereon to permit rotation of the shaft with respect to the disconnect member and to permit sliding movement of the disconnect member on the shaft in the axial direction, said disconnect member supporting at least one projection movable therewith and having a tapered end thereon receivable in the tapered recess to rotate the disconnect member with the surface and the shaft, said tapered projection end and tapered recess defin-

ing engaging cam surfaces such that the projection end is forced out of the recess upon application of a force retarding rotation of the projection relative to the surface having said recess and the disconnect member is moved axially to a disconnect position, the rotary disconnect assembly further comprising controllable means for moving the disconnect member axially on the shaft away from the surface having the recess to the disconnect position so as to move the tapered projection end out of the recess, whereby the rotary motion of the plate and shaft can be disconnected from the disconnect member



upon actuation of the controllable means for moving, the disconnect member having a first peripheral channel about its outer circumference encircling the shaft, and the controllable means for moving including at least one roller received in the first peripheral channel, and a first lever member supporting the roller and being movable in one direction for forcing the roller against one wall of the channel to cause the disconnect member to move away from the surface with the tapered recess and being movable in the opposite direction for forcing the roller against an opposite wall of the channel to cause the disconnect member to move towards the surface.

4,273,231

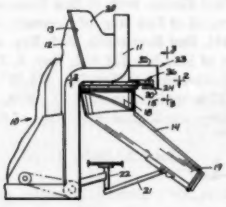
CHUTE BRAKE FOR CONCRETE MIXING VEHICLES

Jan Hodneland, Spokane, Wash., assignor to Central Pre-Mix Concrete Co., Spokane, Wash.

Filed Nov. 5, 1979, Ser. No. 91,578

Int. Cl.³ B65G *11/00*

U.S. Cl. 193—10 **6 Claims**



1. A chute brake for a concrete mixing vehicle having a mixing drum movably mounted to a supporting framework, a horizontal ring bearing with an annular stationary bearing plate fixed to the framework and a coaxial rotatable bearing plate movably suspending the chute from the framework at a location adjacent the mixing drum for pivotal movement of the chute about a vertical bearing axis, the chute brake comprising:

a horizontal arcuate anchor rim fixed to one of the bearing plates and arranged coaxially about the bearing axis, said rim having top and bottom opposed horizontal surfaces;

rigid brace means fixed to the framework at a location elevationally adjacent one surface of the anchor rim, for slidably engaging said one surface; and

brake actuator means operably mounted to the framework adjacent the remaining surface of the anchor rim opposite the brace means for selectively clamping the anchor rim against the brace means to selectively prevent pivotal movement of the chute relative to the framework about the bearing axis.

4,273,232

PASSENGER CONVEYOR BALUSTRADE

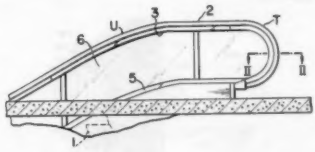
Cyuichi Saito, and Katsuya Teranishi, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 20, 1978, Ser. No. 952,985

Claims priority, application Japan, Oct. 28, 1977, 52-128762

Int. Cl.³ B65G *15/00, 17/00*

U.S. Cl. 198—335 **4 Claims**



1. In a balustrade for use with passenger conveyors including a first deck member provided with a guide for guiding a handrail which is adapted to be moved in synchronism with an endless series of steps, a second deck member formed of sheet material connected to the first deck member, the second deck member having a U-shaped cross-sectional configuration opening in a direction opposite the handrail, each of said first and second deck members being bent to assume a first arcuate shape at landings of the passenger conveyor, the improvement comprising second arcuate-shaped portions provided adjacent opposite ends of said first arcuate-shaped portion of the second deck member, the second arcuate-shaped portions having larger radii of curvature than that of the first arcuate-shaped portion, said second deck member being bent inwardly about the opening of the arcuate-shaped portions to provide deformation preventing strips.

4,273,233

APPARATUS FOR CONVEYING ROD-LIKE ARTICLES

Dennis Hinchcliffe; George R. Bennett, and Frank Heybourn, all of London, England, assignors to Molins, Limited, London, England

Filed Oct. 30, 1978, Ser. No. 955,539

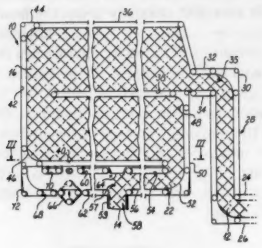
Claims priority, application United Kingdom, Nov. 1, 1977, 45452/77

Int. Cl.³ B65G *1/04*

U.S. Cl. 198—347 **22 Claims**

1. Apparatus for conveying rod-like articles, including an inlet for rod-like articles; an outlet for rod-like articles; first conveyor means for moving a stack of said articles unidirectionally from the inlet to the outlet; second conveyor means for moving a stack of said articles to and from a junction with the first conveyor means, said first and second conveyor means

respectively defining first and second paths having major portions at least which respectively extend in adjacent laterally-spaced, substantially-vertically planes and are disposed generally side-by-side with respect to each other.

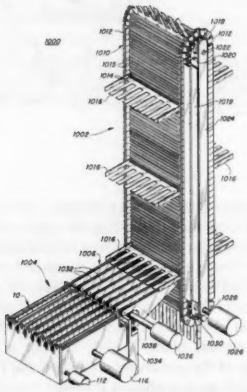


4,273,234

CONVEYOR STORAGE SYSTEM

Ronald D. Bourgeois, 38 Ellison Park, Waltham, Mass. 02154

Filed Feb. 2, 1979, Ser. No. 8,881
Int. Cl.³ B65G *37/00*
U.S. Cl. 198—347 **2 Claims**



1. A conveyor storage system comprising:

an elevator conveyor system including an elevator conveyor; first drive means for driving said elevator conveyor; and first control means for selectively energizing said drive means in the load and unload directions; said elevator conveyor having a plurality of carrier members fixed to and spaced longitudinally along it and extending outwardly therefrom; each of said carrier members including a plurality of elements extending outwardly from said conveyor and spaced from each other; and

a transfer conveyor system including a delivery conveyor system having a plurality of individual modular conveyor units for engaging with said carrier members; said conveyor units being spaced apart to accommodate said carrier elements and extending into the spaces between said elements to load and unload said elevator conveyor system; second drive means for driving said conveyor units; and second control means for selectively energizing said second drive means in the load and unload directions for receiving and replacing product with its orientation unchanged; said transfer conveyor system further including a diverting conveyor system including: a support structure; a static conveyor including a plurality of spaced rollers mounted in said support structure; a drive apparatus for continuously driving said rollers; a main direction control device for operating said drive apparatus to drive said rollers to convey selectively in the forward and reverse direction; a support frame and a mounting structure carried on the support structure for slidably supporting said support frame; said mounting structure including spaced slides for slidably receiving a slide member carried by said support frame; an endless roller chain conveyor having parallel sets of raised laterally spaced flights and a drive chain section carried by said support frame; a drive system mounted on said support frame for continuously driving said roller conveyor; a transverse direction control device for operating said drive system to drive said roller conveyor to convey selectively in the left and right directions; and

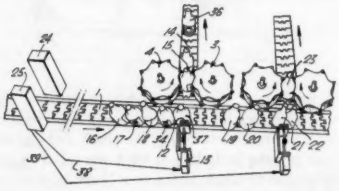
actuator means mounted on said support structure for moving said support frame selectively up to insert said flights interstitally of said rollers to divert conveyed goods from the main direction and down to withdraw said flights and allow goods to continue in the main direction.

4,273,235

DEVICE FOR SELECTIVE FEED OUT OF ARTICLES

Willy Rustand, Asker, Norway, assignor to Tomra Systems A/S, Asker, Norway

Filed Apr. 2, 1979, Ser. No. 25,809
Claims priority, application Norway, Apr. 7, 1978, 781233
Int. Cl.³ B65G *65/04, 43/00, 33/06*
U.S. Cl. 198—372 **6 Claims**



6. An assembly in the nature of a plurality of associated conveyors for selectively transferring a supply of articles from one station to another, and comprising at least a pair of spaced coacting rotary units constructed and arranged to move such articles, one by one, from one conveyor to another, detaining means engaging said rotary units such that each article is temporarily detained between the rotary units and out of contact with the first conveyor and the second conveyor while enroute to the second conveyor, and drive means to rotate the rotary units from a detaining mode to a transfer mode.

4,273,236

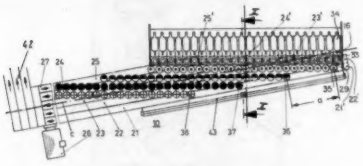
METHOD AND APPARATUS FOR HANDLING BOTTLES

Alois Wahl; Paul Elsner, both of Bad Kreuznach, and Gerhard Born, Bingen, all of Fed. Rep. of Germany, assignors to Seitz-Werke GmbH, Bad Kreuznach, Fed. Rep. of Germany

Continuation of Ser. No. 851,422, Nov. 4, 1977, abandoned, which is a continuation of Ser. No. 675,887, Apr. 12, 1976, abandoned. This application Apr. 27, 1979, Ser. No. 34,166
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1975, 2517757
Int. Cl.³ B65G *47/26*
U.S. Cl. 198—432 **7 Claims**

1. In a system for transferring bottles discharged from a machine in long rows of laterally spaced bottles to substantially shorter rows of laterally spaced bottles on a linear conveyor, the conveyor system for conveying away upright beverage bottles of glass as a reusable packaging container distinct from flat edible food cakes and maintained upright when moving along at an angle, comprising in combination therewith a bottle treatment machine having means to transport bottles in

spaced, parallel rows in a direction perpendicular to said rows and to discharge said bottles in upright position one row at a time in succession, a linear conveyor having a plurality of parallel adjacent belts with a common drive for movement of said belts at a common speed, the direction of travel of said conveyor being at an acute angle to said parallel rows of upright beverage bottles of glass in said machine and at an angle greater than 90° to the direction of movement of said rows of upright beverage bottles of glass in said machine to move said upright beverage bottles of glass by pushing at an equal level height away from said machine, said belts at the upstream end of the upper reach thereof adjacent said machine having staggered reversing supports, a stationary plate extending over the upstream ends of the upper reaches of said belts at the discharge position, means to receive said upright beverage bottles of glass deposited by said machine one row at a time, means to



move each row of upright beverage bottles of glass onto said plate at right angles to said row and to displace the preceding row of upright beverage bottles of glass on said plate to move onto said linear conveyor at an acute angle to the direction of travel of said conveyor with each said row extending from side to side of said linear conveyor at said acute angle, said linear conveyor moving at substantially greater speed than the movement of said rows of upright beverage bottles of glass from said machine such that a plurality of upright beverage bottles of glass in each row of bottles discharged onto said linear conveyor move away from the discharge position before the discharge of the next succeeding row of upright beverage bottles of glass, the speed of discharge being such that upon transferring of a row of upright beverage bottles of glass, generation of noise due to bumping of upright beverage bottles of glass into the upright beverage bottles of glass in the row previously transferred in upright position is avoided.

4,273,237

DEVICE FOR FEEDING CONTAINERS, ESPECIALLY BOTTLES, TO PROCESSING MACHINES, ESPECIALLY CONTAINER CLEANING MACHINES

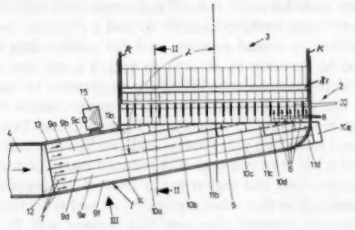
Alois Wahl, and Paul Elsner, both of Bad Kreuznach, Fed. Rep. of Germany, assignors to Seitz-Werke GmbH, Bad Kreuznach, Fed. Rep. of Germany

Continuation of Ser. No. 784,251, Apr. 4, 1977, abandoned. This application May 7, 1979, Ser. No. 36,292

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1976, 2614711

Int. Cl.³ B65G *47/12*

U.S. Cl. 198—445 **9 Claims**



1. Apparatus for feeding containers to a magazine table having a plurality of entrance paths separated by parallel partitions, said apparatus including a conveyor belt arranged at an obtuse angle to said front side of said magazine table and at an acute angle to said paths, to deliver containers to said magazine table, said conveyor belt being formed by a plurality of component belts for delivering containers to said magazine table, the front side of said magazine table overlying said conveyor belt, covering plates overlying said component belts adjacent the front side of said magazine table to guide said containers from said component belts to the entrance paths between said partitions so that groups of containers conveyed by said conveyor belt are individually deflected to said entrance paths, the movement of said containers at an angle to the front side of said magazine table exerting a component of force toward said table to direct said containers into said paths.

4,273,238

COVER BELT CONVEYOR WITH CLOSURE STRIPS

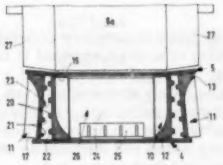
Karl-Günther Bläättermann, Hamburg-Rahlstedt; Günter Neuhaus, Hamburg, and Günther Nolte, Moers, all of Fed. Rep. of Germany, assignors to Conrad Scholtz AG, Fed. Rep. of Germany

Filed Sep. 25, 1979, Ser. No. 78,904

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1978, 2841795

Int. Cl.³ B65G *15/14*

U.S. Cl. 198—605 **5 Claims**



1. In a cover belt conveyor adaptable for use in conveying material from one level to another level and including a carrier belt and a cover belt entrained over respective return drums and having proximal runs defining a conveyor path therebetween, said belts defining proximal surfaces along said runs and extending in spaced apart substantially parallel relationship along the conveyor path, each belt also having opposite side edges thereon, and two longitudinally extending closure strips of flexible material, such as rubber or the like, projecting from the proximal surface of each belt adjacent the respective side edges thereof, the closure strips being so positioned that the closure strips of one belt fit between the cover closure strips of the other belt to form a closed box-shaped conveyor space between the proximal runs of the belts,

the improvement comprising

said closure strips of both belts having a periodic wave form defining wave ridges thereon which project substantially perpendicularly from said proximal surfaces of the respective belts with all of said closure strips projecting approximately the same extent from said proximal surfaces of the respective belts, each of said one belt closure strips being offset inwardly from the respective other belt closure strip adjacent the respective side edge of said other belt so that said one belt closure strips are spaced inwardly a relatively small extent from the respective other belt closure strips in the conveyor path, and profile knobs carried by each closure strip and projecting from the wave ridges thereof, certain of said profile knobs being located on the outer sides of said one belt closure strips, and certain others of said profile knobs being located on the inner sides of said other belt closure strips, said profile knobs

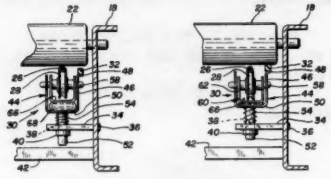
being arranged in longitudinal rows extending substantially parallel with said belts and having contact surfaces thereon facing toward the proximal surfaces of the one belt and the other belt, respectively, so that said contact surfaces of adjacent rows of profile knobs on adjacent one belt closure strips and cover belt closure strips will contact each other to aid in maintaining the closure strips of the one belt in the desired relation to said other belt closure strips along said conveyor path.

4,273,239

ZERO PRESSURE ACCUMULATOR AND BRAKING APPARATUS THEREFOR

John A. Thwaites, Jackson, and Ronald A. Ferrara, Englishtown, both of N.J., assignors to Contran Conveyors & Systems, Inc., Rahway, N.J.

Filed Apr. 23, 1979, Ser. No. 32,654
Int. Cl.³ B65G *13/071, 13/075*
U.S. Cl. 198—781 **18 Claims**



1. A zero pressure accumulator conveyor comprising:

(a) a plurality of sections arranged in tandem, each section including a pair of side rails and a plurality of article supporting rollers at spaced intervals therebetween;

(b) driving means including a combination driven propelling and braking apparatus operatively coupled to said article supporting rollers and disposed on one of said side rails;

(c) a pressurized fluid source; and

(d) an article detecting sensor disposed in each said section, said article detecting sensor being operatively coupled to said pressurized fluid source and said combination propelling and braking apparatus to either simultaneously engage the braking portion while disengaging the propelling portion or simultaneously engage the propelling portion while disengaging the braking portion of said combination propelling and braking apparatus from a plurality of said article supporting rollers by movement perpendicular to said article supporting rollers, said braking forces being applied only in a direction perpendicular to the axis of said article supporting rollers.

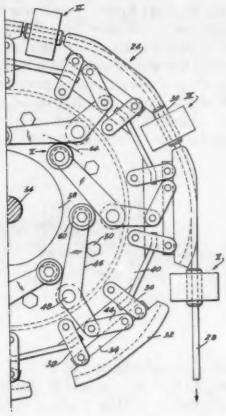
4,273,240

VARIABLE PITCH SPROCKETS FOR CONVEYOR SYSTEM

Robert W. Selleck, Los Gatos, Calif., assignor to Becton, Dickinson and Company, Rutherford, N.J.

Filed Jan. 26, 1979, Ser. No. 6,908
Int. Cl.³ B65G *23/04*
U.S. Cl. 198—835 **29 Claims**

1. A conveyor system comprising; at least one drive sprocket, at least one idler sprocket, a conveying member adapted to carry a work load and to mesh with the sprockets, support structure with the sprockets mounted thereon in a predetermined arrangement in position to mesh with the conveying member to drive and guide conveying member along a predetermined path, spaced elements on the sprockets and speced elements on the conveying member to be spaced from one another in alternate side by side arrangement when the conveying member is meshed with the sprockets, drive means to drive the drive sprocket, means for causing each element on the sprocket to contact an element on the conveying member at a point adjacent the exit of the conveying member from meshing with the sprocket to transfer the load at an advanced position by compressive action between the element of the conveyor and the element of the sprocket in a direction axial to the conveying member, and variable pitch adjustment means on the sprockets to automatically accommodate for a pitch variation on the conveying member and adjust the sprocket



circumferentially between entry and exit of the meshing of the conveying member and the sprocket to continue to mesh with the conveying member without the spaced elements on the sprockets contacting the spaced elements on the conveying member at the entry and exit of the meshing of the conveying member and sprocket.

4,273,241

REFLECTOR UNIT FOR PHOTOFLASH ARRAY

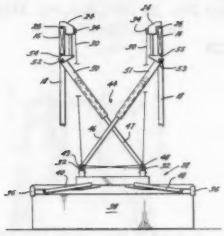
Andrew Smetana, Mentor, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 5, 1979, Ser. No. 54,776
Int. Cl.³ B65D *21/02;* **G03B** *15/02*
U.S. Cl. 206—520 **6 Claims**

1. A reflector unit for assembly into a photoflash array, comprising a sheet-like member shaped to provide a plurality of individual reflectors and having a substantially flat front surface area between two of said individual reflectors, said reflector units being contoured so that a plurality thereof can be stacked in nested manner, said flat surface area being intended to function as an area to which a vacuum device is applied for successively lifting the uppermost reflector units from the stack thereof, wherein the improvement comprises one or more cup-like depressions formed in said front surface area and extending rearwardly, said cup-like depressions being shaped to have an end region of reduced diameter and a flange connecting said end region to the next of the depression, and dimensioned so that when a plurality of said reflector units are stacked the reduced diameter end regions will fit into the cup-like depressions of an adjacent reflector unit and the flanges will be near or against the flat front surface area of said adjacent reflector unit, thereby improving the stacking alignment and also preventing said flat surface area from being

appreciably distorted when said vacuum lifting device is applied thereto.

4,273,242
STABILIZING DEVICE
Donald W. Schaper, Alliance, Ohio, assignor to Marathon LeTourneau Company, Longview, Tex.
Filed May 18, 1979, Ser. No. 40,330
Int. Cl.³ B66C *13/06*
U.S. Cl. 212—147 **19 Claims**



1. A stabilizing apparatus for preventing sway of a body suspended from an overhead support, said apparatus comprising:

a first relatively elongate rigid stabilizing member pivotally connected at one of its ends to one of said body and said overhead support;

first guide means carried by the other of said body and said overhead support and adapted to coact with said first stabilizing member;

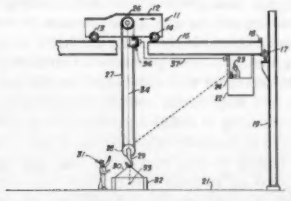
a second relatively elongate rigid stabilizing member pivotally connected at one of its ends to one of said body and said overhead support;

second guide means carried by the other of said body and said overhead support and adapted to coact with said second stabilizing member;

said first and second stabilizing members coacting with said first and second guide means to permit said stabilizing members to slide relative to said guide means in a direction parallel to said stabilizing members' longitudinal axis, whereby said body may be raised and lowered relative to said support;

force transmitting means interconnecting said first and second stabilizing members for transmitting a force applied to said body in a direction tending to cause sway to said first and second stabilizing members in opposed directions, whereby said body is stabilized against sway.

4,273,243
LIFT CENTERING DEVICE
Frank S. Locher, R.D. #1 Kepple Hill, Vandergrift, Pa. 15690
Filed Apr. 18, 1979, Ser. No. 31,163
Int. Cl.³ B66C *19/00*
U.S. Cl. 212—153 **11 Claims**



1. A crane load centering means for use in combination with a crane system,

said crane system having a cable winding means with a cable having at least one end secured thereto,

said cable supportably passing through a traveling block,

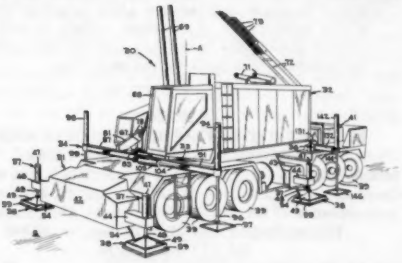
said traveling block including hook means to be secured to a load to be lifted,

a load centering means secured to said traveling block and positioned adjacent and positioned away from said traveling block and out of contact with said cable,

said load centering means having a null condition when said crane system is not in use and said load centering means is in a predetermined spatial relationship with a vertical line and a line which is coincident with the cable center line in the region between said traveling block and said cable winding means,

said load centering means including at least four electrical switch means spatially positioned in respect of said cable such that relative movement of said predetermined cable center line, vertical line spatial relationship actuates at least one of said electrical switches to provide an indication that said null condition has been disturbed and that should said load be lifted while said indication is present, said load will not receive optimal lifting from said traveling block of said crane system.

4,273,244
CRANE UPPERSTRUCTURE SELF-TRANSFERRING SYSTEM
Lyle B. Jensen, Cedar Rapids, and Leroy L. Wittman, Marion, both of Iowa, assignors to FMC Corporation, San Jose, Calif.
Filed Jan. 29, 1979, Ser. No. 7,102
Int. Cl.³ B66C *23/84*
U.S. Cl. 212—181 **10 Claims**



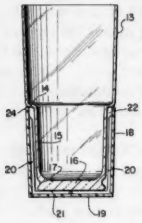
1. A crane upperstructure self-transferring system comprising a crane upperstructure frame having a front end and a rear end, a carrier for supporting the crane upperstructure frame, a quick disconnect turntable mounting interconnecting the carrier and the frame for rotation of the frame about a generally vertical axis, boom foot pins mounted at the front end of the frame, a front lifting assembly attachable to the frame by the boom foot pins, a counterweight mounting mechanism mounted at the rear end of the frame, a rear lifting assembly attachable to the frame by the counterweight mounting mechanism, said carrier having outrigger support jacks, and an air pad assembly positioned between a surface supporting the carrier and the outrigger support jacks enabling lateral movement of the carrier to align the carrier with the generally vertical axis of the quick disconnect turntable mounting, said front and rear lifting assemblies being operable to transfer said upperstructure frame between a position supported on said carrier and a position spaced from said carrier and supported by other means.

4,273,245

INSULATED GLASS VESSEL

Pio Hartinger Machalek, Pershing 287, Lima, Peru

Filed Nov. 26, 1976, Ser. No. 745,246
Int. Cl.[3] B65D *6/10*
U.S. Cl. 215—13 R 5 Claims



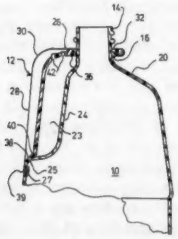
1. A vessel assembly comprising:
a glass vessel formed of glass or crystal and having an upper portion and a lower portion, said upper portion having a diameter greater than the diameter of said lower portion, said upper and lower portions being integrally formed and being joined by a step;
a substantially tubular shell formed of a plastic material having a low thermal conductivity;
said glass vessel being positioned within said shell such that said shell surrounds said lower portion of said glass vessel;
said shell having an inner diameter greater than the outer diameter of said lower portion of said glass vessel, thereby forming an annular space therebetween;
said annular space being completely filled with a synthetic resin material having a low thermal conductivity, said resin material being firmly bonded to the interior of said shell and the exterior of said lower portion of said glass vessel, thereby forming a permanently joined and solid assembly; and
said shell having an outer surface which is symmetrical with and a continuation of the outer surface of said upper portion of said glass vessel, such that the outer surface of said assembly is continuous and unbroken.

4,273,246

BOTTLES WITH ATTACHED HANDLES AND A METHOD OF FORMING THE SAME

Mortimer S. Thompson, P.O. Box 113, Enfield, Conn. 06082

Continuation-in-part of Ser. No. 28,886, Apr. 10, 1979, which is a continuation of Ser. No. 877,603, Feb. 14, 1978, abandoned.
This application May 21, 1979, Ser. No. 40,865
Int. Cl.[3] B65D *23/10*
U.S. Cl. 215—100 A 32 Claims



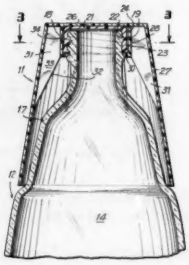
1. A bottle having a neck portion, a sidewall and a lifting, carrying and pouring handle attached thereto, wherein said handle generally is L-shaped and is positioned substantially within the breadth of the bottle, and includes a generally horizontal leg attached to said neck portion, and a generally vertical leg in engagement with the sidewall of the bottle which has been flexed outwardly to place said handle under tension and to maintain said generally vertical leg in engagement with the sidewall of the bottle during lifting, carrying and pouring.

4,273,247

BOTTLE CLOSURE-CUP ASSEMBLY

William L. Earls, Cincinnati, Ohio, assignor to Schenley Industries, Inc., New York, N.Y.

Filed Jan. 28, 1980, Ser. No. 115,591
Int. Cl.[3] B65D *51/24*
U.S. Cl. 215—228 17 Claims



1. A bottle closure-cup assembly comprising:
a rotatably removeable bottle cap; and
a cup having a base and a substantially rigid side-wall extending from said base, a substantially cylindrical collar extending from said base and spaced apart from said sidewall and a plurality of fins extending between said sidewall and said collar, the interior surface of said collar including inwardly projecting means for engaging said bottle cap,
whereby said cup and bottle cap may be rotatably displaced as a unit to remove said bottle cap from the bottle and said cup may be separated from the bottle cap by pulling the cup axially away from the bottle without rotating the bottle cap.

4,273,248

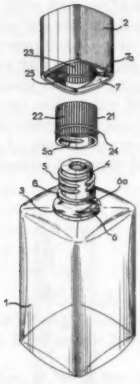
SHAPED CAPS AND CONTAINERS

Myrtil B. Lehmann, Saint Cloud, France, assignor to Chanel, Neuilly-sur-Seine, France

Filed Jul. 6, 1979, Ser. No. 55,487
Claims priority, application France, Jul. 7, 1978, 78 20257
Int. Cl.[3] B65D *51/18*
U.S. Cl. 215—331 9 Claims

1. In a container having a non-circular container body and a non-circular cap and guide means for ensuring repeatable helical movement of the cap about an axis of rotation and relative to the container body during sealing of an outlet of the container by the cap, the improvement comprising abutment means on the container and stop means on the cap, the abutment means and stop means comprising respective faces repeatably cooperating to define a predetermined orientation of the cap relative to the body of the container at the termination of the said helical sealing movement and said cap being a two-part cap having an inner and an outer part, the inner part engaging with the container by said guide means and the outer part being separate from the inner part, driving means for interengaging the inner and outer parts and for permitting

relative slippage between the same, said driving means comprising a first portion on said outer part and a second portion



on said inner part, said outer part bearing said stop means and said inner part including sealing means for sealing the outlet.

4,273,249

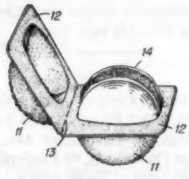
SANDWICH CONTAINER

John Florian, Bakersfield, Calif., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 513,601, Oct. 10, 1974, abandoned. This application Jun. 22, 1977, Ser. No. 808,755

Int. Cl.³ B65D *1/26, 17/28*

U.S. Cl. 220—4 E **2 Claims**



1. A disposable container of foamed thermoplastic resin for dispensing a circular sandwich and for convenient cosumption of such sandwich from a portion of the container comprising two generally similar recesses each defined by two semi-circular walls and a side walls integral with each edge of said semi-circular walls, the radius of said semi-circular walls being greater than the spacing of said side walls, the said recesses being adapted to enclose a circular sandwich with a portion thereof disposed in each recess when the said recesses are placed in abutting relation of the openings of said recesses, a flange integral with the semi-circular and side walls of each recess and extending outwardly therefrom, a hinge constituting a line of weakened area of the container integral with the flange of each recess extending from one end of the semi-circular wall thereof and parallel to such end, whereby the portions of the container may be separated by tearing along said weakened area to expose said circular sandwich projecting from one of said portions for convenient consumption with retention of liquids dripping from said sandwich in said recess to avoid soiling by said liquids; the flange integral with one side wall of each of said recesses being of a width adapted to cause the adjacent side wall to slope downward from the opening of the recess when the container or one portion thereof is at rest supported on a surface by a flange of such width and the adjacent side wall to assure retention of liquids in the container or portion thereof.

4,273,250

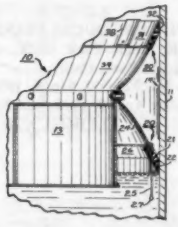
SEALING SYSTEM FOR LIQUID STORAGE TANKS

Mark D. Kinghorn, Sr., 1333 Rte. 30, Schererville, Ind. 46375, and Mark D. Kinghorn, Jr., 8044 Howard, Munster, Ind. 46321

Continuation of Ser. No. 873,218, Jan. 30, 1978, abandoned. This application Apr. 26, 1979, Ser. No. 33,697

Int. Cl.³ H05B *1/00;* **A45D** *1/04*

U.S. Cl. 220—220 **11 Claims**



1. A sealing system for use with a liquid storage tank having a roof freely floating on the contents stored within the tank comprising

a circumferentially radially outwardly extending primary wiper seal means for engaging a radially inwardly directed inner wall of the liquid storage tank to form a substantially liquid tight seal therewith,

supporting means adapted to be connected to the roof of the liquid storage tank and supporting said primary wiper seal means for applying a force thereto biasing said primary wiper seal means into sealing engagement with the inner wall of the liquid storage tank forming said wiping seal therewith at a position above the level of any liquid contained therein,

said primary wiping seal means having two parallel sides each of which extend a length substantially exceeding its thickness and a sealing face having its entire sealing area formed to extend parallel to the inner walls of the liquid storage tank when in an unbiased condition without said biasing force applied thereto and inclined obliquely from at least one of said parallel sides for wiping said wall upon movement of the tank roof relative thereto, and

vapor barrier means supported from said supporting means for inhibiting evaporation of the liquid contained within the liquid storage tank.

4,273,251

SAFETY DEVICE

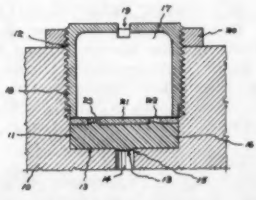
John B. McMahon, Eastwood, Australia, assignor to The Commonwealth Industrial Gases Limited, Surry Hills, Australia

Filed Jan. 30, 1980, Ser. No. 116,732

Claims priority, application Australia, Feb. 1, 1979, PD7525

Int. Cl.³ B65D *51/16;* **F16K** *17/40*

U.S. Cl. 220—361 **3 Claims**



1. A fusible safety device for a pressure vessel having a counter-bore formed in the vessel wall with an outer end open to atmosphere and an inner end defined by a floor, and a vent

bore having an inner end open to the vessel interior and an outer end opening to said floor; comprising:

(a) a tablet of fusible material able to rest on said floor in coverage of the outer end of said vent bore,

(b) a sleeve screw-threaded into said counter-bore,

(c) a rigid pressure plate tightly sandwiched between said tablet and said sleeve, and

(d) at least one hole in said pressure plate axially displaced relative to said vent bore.

4,273,252

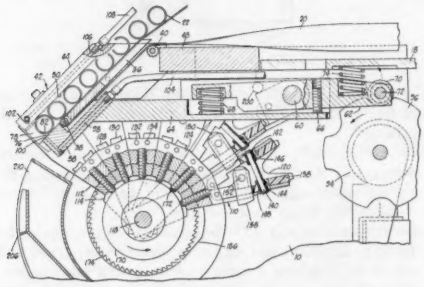
TAPED PRODUCTS PROCESSOR

Larry J. Marshall, Menlo Park, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Division of Ser. No. 721,700, Sep. 9, 1976, abandoned. This application Aug. 7, 1978, Ser. No. 931,545

Int. Cl.³ B65H *5/28*

U.S. Cl. 221—13 **2 Claims**



1. A controlled product feed apparatus comprising

a first member and second member defining a control station wherein work may be positioned, said second member including a stop to hold the work in said control station and being pivotally mounted for selective separation from said first member to allow the work to pass from said control station;

feed means including a work feed path extending to said control station and means for advancing work along said feed means to said control station; and

detection means for sensing an interrupted path extending from said first member to said second member across said control station such that work in said control station will interrupt said path and said separation of said second member from said first member will interrupt said path, said detection means being associated with means for advancing work to activate said means for advancing work when said path is uninterrupted, said detection means for sensing an interrupted path including a nozzle, a source of pressurized air, an orifice, and a pressure activated switch, said nozzle is in one of said first and second members and said orifice is in the other of said first and second members.

4,273,253

AUTOMATIC VENDING MACHINE

Nobuyasu Tanaka; Kazuhira Nakajima; Kaoru Yamaguchi; Shinji Hara; Morihiro Murata; Tetuyosi Nakazima; Hirosi Matuo; Akura Onishi, and Kazuo Hirano, all of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

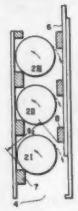
Filed Oct. 22, 1979, Ser. No. 87,180

Claims priority, application Japan, Oct. 26, 1978, 53-131995

Int. Cl.³ B65H *29/34*

U.S. Cl. 221—75 **9 Claims**

1. A product rack for an automatic vending machine, comprising: a rack housing defining a product containment space in which product items are arranged in at least one vertical line one above another with means for providing a product delivering outlet at the bottom thereof, said product items being substantially cylindrical in shape and having equal dimensions; a movable rack board provided opposite to one side wall of said rack housing, said rack board being movable vertically; first and second groups of product supporting members provided respectively on said one side wall and said movable rack board at equal vertical intervals and protruding inwardly; and a drive mechanism for performing a lifting operation wherein said movable rack board is moved upwardly from a lower standby position thereof and is then moved downwardly to said lower standby position, the vertical interval distance h of each of said first and second groups of product supporting members, the horizontal distance l between said one side wall



and said second group of product supporting members or between said movable rack board and said first group of product supporting members, a product passage clearance g between said first and second groups of product supporting members, and the stroke length of said lifting operation of said movable rack board being determined such that said product items are supported by respective pairs of product supporting members of said first and second groups in said standby position and pass through said product passage clearance between said first and second groups of product supporting members and move downwardly by one step during one vertical reciprocation of said movable rack board.

4,273,254

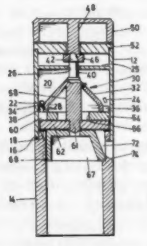
DEVICE FOR CONTAINING AND DISPENSING PARTICLES SUCH AS TABLETS

Brian Cuppleditch, 16 Devonshire Ave., Bryanston, Sandton, Transvaal, and Clive Lewis, 99 Packard St., Woodmead, Sandton, Transvaal, both of South Africa

Filed Jan. 23, 1979, Ser. No. 5,886

Int. Cl.³ B65D *83/04*

U.S. Cl. 221—196 **7 Claims**



1. A container-dispenser for particles comprising a housing having walls defining a chamber in which at least a part is generally cylindrical, a circular floor mounted rotatably in the generally cylindrical part of the chamber and having centrally on its upper surface an upwardly narrowing protrusion, the floor being formed with an aperture adapted to receive a measured quantity of the particles from a supply of the particles located in the chamber, a diaphragm located in the chamber

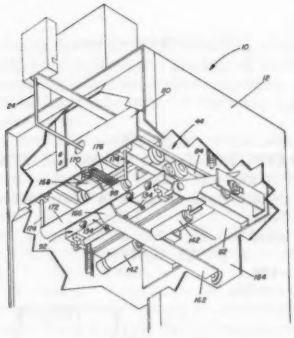
below the floor and being formed with an aperture adapted, in one position of the floor relatively to the housing, to register with the aperture in the floor, means to rotate the floor and its protrusion in the chamber relatively to the housing, a particle delivery opening in said housing walls below said diaphragm, and receiving means located below the diaphragm to receive a measured quantity of the particles which has been transferred, on such rotation, through the aperture in the floor to the aperture in the diaphragm and thence to the receiving means, the receiving means comprising a body surrounding a substantial portion of the lower portion of said housing, said body having a chute extending generally spirally around the housing with the head of the spiral chute disposed adjacent said delivery opening and said chute ending in a basin-like zone extending away from the walls of the housing and in which the measured quantity of the particles will come to rest to assure easy access to such particles by a user.

4,273,255

NEWSPAPER DISPENSER

Kenneth D. Overall, 328 Paragon Mills Rd., Nashville, Tenn. 37211

Filed Nov. 26, 1979, Ser. No. 97,177
Int. Cl.³ B65H *3/22*
U.S. Cl. 221—213 **35 Claims**



1. A mechanism for slidably propelling a single substantially planar item in a direction substantially within the plane of said planar item, comprising:

a transverse bar position adjacent to the planar item;

mounting means for mounting the transverse bar adjacent to the planar item, said transverse bar being movable through linear motion between a retracted position and a dispensing position;

at least one pin mounted on said transverse bar and being movable by the rotation of said transverse bar between an engagement position and a disengagement position, said pin being positioned to engage the planar item when in the engagement position and to disengage the planar item when in the disengagement position;

a cocking lever extending from said transverse bar;

a cocking stop positioned to selectively engage said cocking lever;

said cocking lever being oriented to engage the cocking stop as the transverse bar moves in a direction from the dispensing position toward the retracted position, said cocking stop being operable to cocking said lever to rotate and transverse bar to place said pin in the engagement position when said transverse bar is in the retracted position;

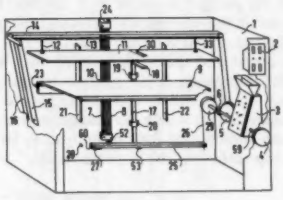
said pin being operable to engage and slidably propel said planar item in a linear direction when said transverse bar is moved from the retracted position to the dispensing position.

4,273,256

APPARATUS FOR DISPENSING PRINTED PRODUCTS

Hans Wenner, Lessingstrasse 40, 6901 Eppelheim, Fed. Rep. of Germany

Filed Oct. 13, 1978, Ser. No. 951,358
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1977, 7731990[U]
Int. Cl.³ B65H *1/14, 3/24;* G07F *11/14*
U.S. Cl. 221—230 **17 Claims**



11. An apparatus for dispensing folded or stitched printed products such as newspapers or periodicals, said apparatus being of the type which includes a housing with an automatic coin system and a turning device which is rotated after coin insertion to deliver a printed product through a delivery slot, the housing having therein two perpendicular detent rods arranged parallel to one another, one detent rod being arranged fixedly and the other being arranged to move upwards and downwards, and a transport plate for carrying the printed product stack arranged for upward and downward movement adjacent the detent rods, the transport plate having two pivotable pawls for engagement with the two detent rods, wherein the improvement comprises:

the detent rods (**7, 8**) are arranged side by side on the housing rear wall and the transport plate (**9**) is arranged horizontally, and further comprising a push plate (**11**) displaceably arranged above the transport plate, the push plate having gripper means (**38, 39, 74**) for expelling the printed product lying uppermost on the stack, a lever (**25**) pivotable about an axis (**27**) arranged beneath the ends of the detent rods and approximately horizontally along the housing rear wall, on which lever the movable detent rod stands freely, and a draw cable (**46**) operationally connected between the free end of the lever and the turning device (**4**).

4,273,257

JAR MOUNTED PIPETTOR

James C. Smith, Hayward, and Richard D. Reed, Sonoma, both of Calif., assignors to Sherwood Medical Industries Inc., St. Louis, Mo.

Filed Jul. 18, 1977, Ser. No. 816,853
Int. Cl.³ G01F *11/02*
U.S. Cl. 222—43 **4 Claims**

3. A pipettor, comprising:

a dispenser body including a plunger chamber as part of a structure with its lower portion adapted to be fastened onto a bottle top,

a plunger assembly operable for reciprocating a plunger back and forth within said plunger chamber, said plunger assembly terminating in an end extending outward of the top of said dispenser body,

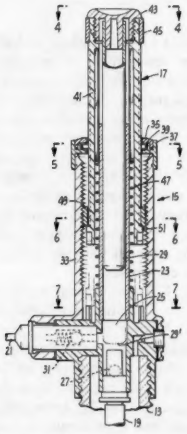
valve means for permitting liquid to be drawn from the bottle into the plunger chamber upon movement of said plunger assembly in a direction outward of the top dispenser body end and to discharge liquid therefrom in response to movement of said plunger assembly in a direction into the dispenser body, the volume of liquid so discharged depending upon the length of the plunger's downward stroke,

means for providing a fixed maximum position that said plunger assembly can be pushed into said dispenser body,

resilient means within said dispenser body for urging said plunger assembly to a rest position outward of the dispenser body,

means responsive to rotation of said plunger assembly for continuously controlling the permissible stroke length by adjusting the rest position of said plunger assembly, thereby to provide control of the volume of liquid discharged in one reciprocation of said plunger,

a vertical liquid volume scale provided on the outside surface of the plunger assembly in a line oriented along its length and in the area thereof that is capable of protruding from the end of said dispenser body, thereby to provide a coarse reading of the liquid volume that is discharged upon full depression of the plunger assembly, the major markings on said coarse scale being spaced apart a distance equal to that which the plunger assembly advances in one revolution, said scale being read by its intersection with a top surface of the dispenser body,



a circular scale provided around said top dispenser body surface and surrounding said protruding end of the plunger assembly, said circular scale having a given number of equally spaced major volume markings, said circular scale being read upon its intersection with said vertical scale, whereby a combination of the readings from both scales provides fine and coarse adjustment of the piston stroke length, and

positive detent means within said dispenser body for establishing a plurality of stable rotatable positions of the plunger equal to said given number, said positive detent means oriented so that at each stable position said vertical scale is opposite a major marking of said circular scale, said stable positions being overcome by enough hand force to rotate said plunger assembly to a new volume setting when desired.

4,273,258

TOOTH PASTE DISPENSER

Charlene Stevenson, 752 NE. 83, Oklahoma City, Okla. 73114

Filed Mar. 14, 1979, Ser. No. 20,379

Int. Cl.³ B65D *35/28*

U.S. Cl. 222—103 **4 Claims**

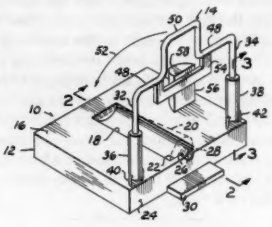
1. In a holder for a collapsible tube containing paste material and having a discharge nozzle, the improvement comprising:

a base having an upper surface provided with an elongated transversely arcuate recess for nesting a longitudinal peripheral portion of said tube with its nozzle overhanging one side edge surface of said base;

frame means hingedly connected with said base adjacent said one side edge surface for vertical movement about a horizontal axis toward and away from said tube,

said frame means including a generally U-shaped member having a bight portion and parallel legs,

a pair of casings telescopically receiving one end portion of said legs, and,



springs normally biasing said legs toward a telescopically extended position; and,

pressure foot means supported by said frame means for extruding paste through said nozzle.

4,273,259

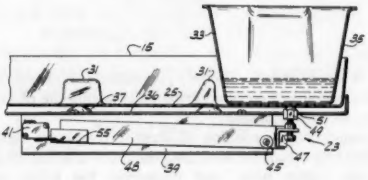
FLOOD CONTROL FOR A BEVERAGE VENDOR

William V. Koeneker, St. Louis, and Franklin D. Newkirk, Florissant, both of Mo., assignors to UMC Industries, Inc., Stamford, Conn.

Filed Sep. 27, 1979, Ser. No. 79,352

Int. Cl.³ B67D *1/16*

U.S. Cl. 222—108 **12 Claims**



1. A flood control apparatus for a beverage vendor of the type comprising a cabinet, a station where beverage is delivered into a cup, a water supply system including a line for bringing water into the cabinet to provide water for beverages, and a valve in said line; said control means comprising:

a pan having a bottom and upstanding side walls, the pan being located beneath components of the water supply system within the cabinet to collect water discharged upon a failure of any of the components, said pan being adapted resiliently to flex downward at least in part under the weight of water collected in the pan;

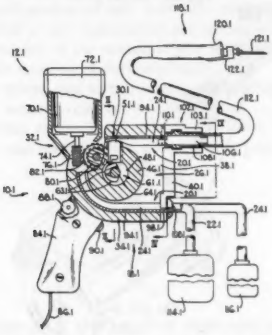
means in the cabinet for supporting the pan with said part of the pan free to flex downward under the weight of water collected in the pan; and

means engageable by said part of the pan on said downward flexing thereof for closing the valve to cut off the supply of water, said means for closing the valve being actuated to close the valve upon said part flexing downward under the weight of the water collected in the pan.

4,273,260
DISPENSING OF FLUENT MATERIALS

George E. Bush, 65 Hillman St., Woodmead East, Sandton, Transvaal Province, South Africa

Filed Jan. 24, 1979, Ser. No. 6,145
Claims priority, application South Africa, Feb. 3, 1978, 78/0674
Int. Cl.³ B67D 5/52
U.S. Cl. 222—135 6 Claims



1. A dispensing device for use in dispensing measured quantities of fluent material through a plurality of resiliently compressible dispensing tubes, the device comprising:

a housing having a tube zone for receiving a plurality of dispensing tubes;

collapsing means for collapsing, in compression zones, dispensing tubes when located in the tube zone;

said collapsing means including a plurality of displaceable compression members slidably connected to said collapsing means and projecting to different extents beyond the periphery of said collapsing means for cooperating with the dispensing tubes when located along different radii of curvature in the tube zone;

displacement means for displacing the collapsing means to advance the compression zones along compression paths to dispense fluent materials through said dispensing tubes, the compression paths being of different effective lengths;

a plurality of fixed cam members to cooperate with said collapsing means to define the effective length of the compression paths affected by the collapsing means during operation of the collapsing means;

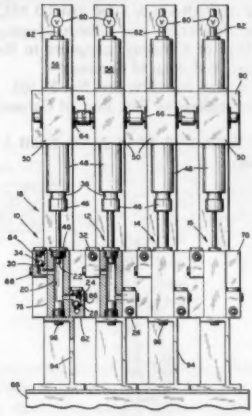
said cam members being adapted to cooperate with the respective compression members to define the effective lengths of the compression paths affected by the compression members.

4,273,261
METERING APPARATUS

Wallace F. Krueger, 4401 Merriweather Rd., Toledo, Ohio 43623

Filed Apr. 4, 1979, Ser. No. 27,032
Int. Cl.³ B67D 5/52
U.S. Cl. 222—135 19 Claims

1. Apparatus for metering material comprising means forming a first cylinder having a first ram reciprocable therein, first inlet means connected to said first cylinder for supplying material to said first cylinder, said first inlet means having a first check valve enabling flow of the material only toward said first cylinder, first outlet means connected to said first cylinder for receiving metered material from said first cylinder, said first outlet means having a second check valve enabling flow of the material only away from said first cylinder, means forming a second cylinder having a second ram reciprocable therein, second inlet means connected to said second cylinder for supplying material to said second cylinder, said second inlet means having a third check valve enabling flow of the material only toward said second cylinder, second outlet means connected to said second cylinder for receiving metered material from said second cylnder, said second outlet means having a fourth check valve enabling flow of the material only away from said

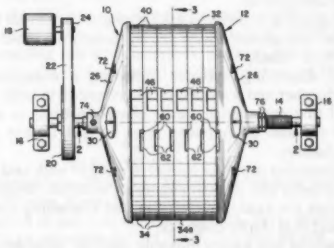


second cylinder, a first gear rack connected to said first ram, a second gear rack connected to said second ram, a pinion between said racks and meshing with both, and means for driving said first gear rack and second gear rack comprising a fluid-operated cylinder connected with each of said gear racks.

4,273,262
ROTARY DISPENSER APPARATUS

Spencer R. Hanson, Rte. 2, Box 217, Blair, Wis. 54616

Filed Nov. 28, 1977, Ser. No. 855,296
Int. Cl.³ A01C 19/00
U.S. Cl. 222—144 12 Claims



1. Apparatus for dispensing a fluid material comprising: a drum adapted to be rotated about a non-vertical axis; said drum defining a chamber therein for fluid material to be dispensed therefrom; said drum having an annular side wall and at least one axial end bell fixedly interconnected for rotation together about said axis; said annular side wall having at least one dispenser ring provided with an arcuate channel; said channel having a radially inner wall and a radially outer wall; a radial inlet opening in said radially inner wall communicating said channel with said chamber; a radial outlet opening in said radially outer wall communicating said channel with space external to said drum; said inlet and outlet openings being angularly displaced from each other about said axis along said channel whereby fluid material passing into said inlet opening and out of said outlet opening must pass through a length of said channel; an adjustable inlet valve disposed at said inlet

opening for adjusting the actual size of said inlet opening; said valve including a weir extending across said inlet opening in the direction of said axis on the leading side of said inlet opening with respect to the direction of rotation about said axis.

4,273,263

FILLING APPARATUS FOR FLUID MEDIA

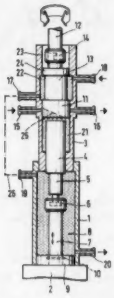
Günther Voegele, Schönaich, and Günter Meyer, Brettheim, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 10, 1979, Ser. No. 37,601

Claims priority, application Fed. Rep. of Germany, May 13, 1978, 2821052

Int. Cl.³ B65B *3/32;* **F04B** *21/08;* **B08B** *3/04*

U.S. Cl. 222—148 **5 Claims**



1. A dispensing apparatus for dispensing a fluid medium in which parts of the apparatus used in dispensing the fluid may be cleaned and sterilized without removal of the parts and the parts are always sterile during dispensing doses which comprises:

a fixed frame;

a fixed cylinder secured at one end to said fixed frame and forming a first sterile chamber;

an axially movable shaft in coaxial relationship with said fixed cylinder;

a dispensing cylinder in axial alignment with said fixed cylinder and mounted with one end axially movable within said fixed cylinder;

said dispensing cylinder including a dosage dispensing chamber and a second sterile chamber in axial alignment;

said first and second sterile chambers being in axial alignment and on opposite sides of said dosage dispensing chamber;

a dispensing piston in coaxial alignment with said dispensing cylinder and in axial alignment with said axially movable shaft for axial movement in said dispensing chamber and said first sterile chamber;

means on said axially movable shaft for securing one end of said dispensing piston to said axially movable shaft;

a first inlet in said dispensing cylinder;

a first outlet in said dispensing cylinder in direct opposition to said first inlet;

a rotary valve in said dispensing cylinder in coaxial relationship therewith in axial relationship with said dispensing piston and in radial alignment with said first inlet and said first outlet;

means for rotating said rotary valve to close and open said first inlet and said first outlet;

a second inlet and a second outlet connected with said second sterile chamber in said dispensing cylinder; a third inlet and a third outlet connected to said first sterile chamber in said fixed cylinder;

whereby fluids may be dispensed with said dispensing cylinder in one position and said dispensing elements may be cleaned and sterilized when said dispensing cylinder is moved to a second position relative to said first sterile chamber in said fixed cylinder.

4,273,264

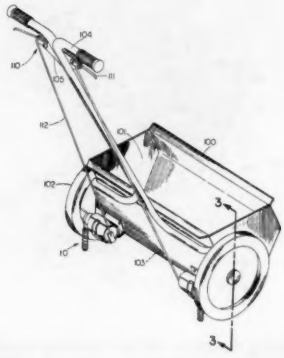
SPREADER MARKER HAVING A GROUND WHEEL ACTUATED AEROSOL SUPPLY

Howard W. Legg, 2229 N. Park, Grand Island, Nebr. 68801

Filed Dec. 3, 1979, Ser. No. 99,796

Int. Cl.³ B67D *5/64*

U.S. Cl. 222—162 **10 Claims**



1. A marking device for a lawn spreader comprising:

a bracket secured to the spreader body;

an aerosol can filled with marking material pivotably supported on said bracket via a retaining member; and

at least one cam means mounted on one wheel of said spreader, and adapted to engage the aerosol can to dispense its contents beneath the lawn spreader.

4,273,265

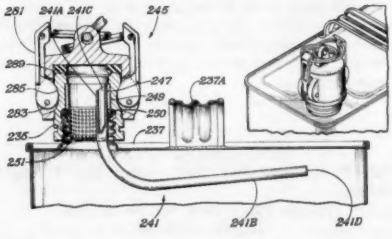
SAFETY DISPENSING SPOUT

Bazeel B. Anderson, 2233 Glenco Ter., Fort Worth, Tex. 76110

Continuation of Ser. No. 51,995, Jun. 25, 1979, abandoned, which is a continuation of Ser. No. 848,496, Nov. 4, 1977, abandoned. This application Jun. 13, 1980, Ser. No. 159,200

Int. Cl.³ B67D *5/58, 3/00*

U.S. Cl. 222—189 **5 Claims**



1. A dispensing spout adapted to be removably coupled to the opening of a container for holding liquid, comprising:

conduit means having a threaded end adapted to be threaded to threaded means defining the opening of a container and having a dispensing end opposite said threaded end,

tube means adapted to be located concentrically in said conduit means,

screen means forming a flame arrester connected to the lower end of said tube means,

a vent tube extending through said screen means and having

a first portion located within said tube means next to its wall,

said vent tube having a second portion adapted to extend out of said threaded end of said conduit means when said tube means and said first portion of said vent tube are located therein with said second portion of said vent tube being adapted to be located in the container when said threaded end of said conduit means is threaded to the threaded means defining the opening of the container,

said second portion of said vent tube extending generally transverse to said first portion and having an end adapted to be located in the container at a position spaced away from the opening of the container,

said tube means, said screen means, and said vent tube being fixedly secured relative to each other,

said conduit means being rotatable relative to said tube means, said screen means and said vent tube.

4,273,266

METHOD AND APPARATUS FOR DISCHARGING MATERIAL FROM BULK CONTAINERS

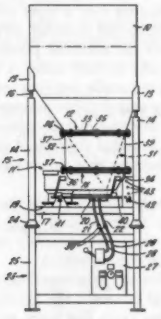
George W. Snape, Shipston-on-Stour, England, assignor to Bulk Unit Load Systems Limited, London, England

Filed Mar. 26, 1979, Ser. No. 24,175

Claims priority, application United Kingdom, Mar. 23, 1978, 11698/78

Int. Cl.[3] **B67D** *5/06;* **B65G** *69/00*

U.S. Cl. 222—199 **8 Claims**



1. Apparatus for discharging material from a bulk container having a discharge opening in its base, vibratory delivery means for conveying material from said opening of the container to a second discharge opening, the delivery means having an inlet connected to the discharge opening of the container by means including a flexible but non-stretchable and non-metallic member defining a duct and means for vibrating the delivery means, characterized in that to assist the passage of the material from the container to the delivery means the flexible but non-stretchable member is convergent in the downward direction and is arranged to transmit vibration from the delivery means to the container, said member being releasably connected to said container and said delivery means, said apparatus comprising a mobile unit, there being provided a frame for supporting both the container and the delivery means, and a second support frame, the frame of the mobile unit having feet for resting on the second frame, and the second frame providing means for minimizing the transmission of vibrations from the delivery means to the second frame.

4,273,267

DEVICE FOR EXTRACTING AND PROPORTIONING PULVERULENT PRODUCTS

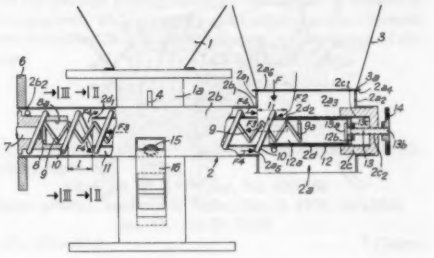
Gilbert G. Conca, Cabries, France, assignor to Societe Anonyme dite: Transitube-Project, Aix-en-Provence, France

Filed May 30, 1979, Ser. No. 43,719

Claims priority, application France, Jun. 2, 1978, 78 17241

Int. Cl.[3] **B65D** *88/54*

U.S. Cl. 222—318 **9 Claims**



1. In a device for extracting and proportioning pulverulent products comprising a hopper and coaxial screws with threads of opposite directions, means for driving said screws in rotation in a cylindrical conduit, said screws being separated from each other by the wall of a tube coaxial to the screws and to the conduit, the screw of smaller diameter rotating inside the tube to convey the product therein in one direction and the screw of larger diameter rotating outside said tube to convey the product in the opposite direction in the space defined between the tube and the conduit, said conduit comprising on its periphery at least one orifice for the flow of the product, said screws being composed of wires helically wound in the manner of a spring, and the tube in which the screw of smaller diameter is mounted, comprising on its periphery and adjacent the hopper an opening for the inlet of the product, in front of which said screws extend at least partially, said product, after having passed through said tube, being taken up by the screw of larger diameter and being transported between said tube and said conduit in the direction towards the hopper to exert a constant pressure at said opening, to avoid the effects of "vault" above the inlet opening and simultaneously to cause the product to pass through said orifice located on the periphery of the conduit.

4,273,268

FLUID SPRAY PUMP

Chester Wickenberg, Elgin, Ill., assignor to Seaquist Valve Co., Div. of Pittway, Cary, Ill.

Continuation of Ser. No. 860,233, Dec. 13, 1977, abandoned. This application Jul. 11, 1979, Ser. No. 56,438

Int. Cl.[3] **G01F** *11/02*

U.S. Cl. 222—321 **20 Claims**

1. A fluid spray pump primarily adapted for pumping a fluid from a fluid container, comprising in combination:

a housing comprising a housing internal cylinder having a first and a second end;

a collar established adjacent said first end of said housing internal cylinder having a collar internal aperture;

one way valve means connecting the fluid container to said housing internal cylinder;

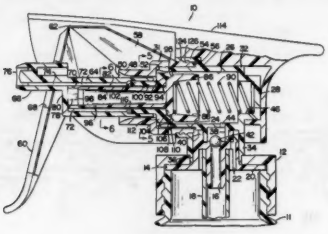
a pump barrel slideably receivable in said internal collar aperture and including a barrel internal bore in communication with a terminal orifice in said pump barrel;

a piston comprising a piston stem and an enlarged piston head with said piston stem being receivable in said barrel internal bore of said pump barrel and with said pump head being receivable in said housing internal cylinder;

channel means for communicating said housing internal cylinder with said terminal orifice;

annular seal means movably mounted between a first and a second position for sealing said channel means when said annular seal means is in the first position and for enabling fluid flow through said channel means when said annular seal means is in the second position;

said annular seal comprising a single tubular sleeve and a sealing member;



said internal bore of said pump barrel including an internal annular seal bore for at least partially receiving therein the total single tubular sleeve portion of said annular seal means; and

said annular seal bore of said pump barrel enabling said annular seal means to move within said internal annular seal bore relative to said pump barrel and said piston to provide fluid communication between said housing internal cylinder and said terminal orifice upon movement of said pump barrel and piston in a direction toward said second end of said housing internal cylinder.

4,273,269

HAND HELD ELECTRIC CAULKING GUN

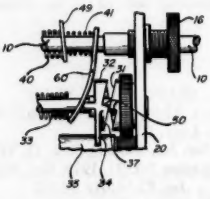
George B. Davis, Jr., 7512 Marbury Rd., Bethesda, Md. 20034

Continuation-in-part of Ser. No. 876,048, Feb. 8, 1978, Pat. No. 4,171,072. This application Jul. 30, 1979, Ser. No. 61,863

The portion of the term of this patent subsequent to Oct. 16, 1996, has been disclaimed.

Int. Cl.[3] B67D *5/46*

U.S. Cl. 222—326 **33 Claims**



1. A hand held electric caulking gun including in combination, a receptable for receiving therein a caulk containing cartridge having a caulk dispensing nozzle, a piston movable when driven through said cartridge to force the caulking therein from said nozzle, means including a reciprocating surface, driving means for said reciprocating surface including an electric motor, a speed reducing drive train connecting said motor with said reciprocating surface whereby operation of said motor causes reciprocal movement of said surface, and a spring piston gripping plate movable by movement of said reciprocating surface to engage in gripping relation the surface of said piston to effect movement of said piston through said cartridge to force caulking therein from said nozzle, said spring piston gripping plate resiliently being yieldable to absorb the reciprocating movement of said reciprocating surface upon a predetermined movement arresting force being applied to the caulk driving end of said piston during operation of said motor.

4,273,270

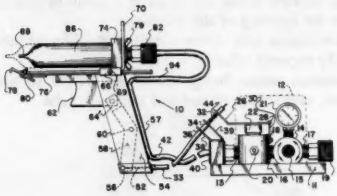
TRIGGER ACTUATED AIR PRESSURE DISPENSING GUN

George C. Kray, 137 Plitt Ave., Farmingdale, N.Y. 11735

Filed Aug. 21, 1979, Ser. No. 68,380

Int. Cl.[3] G01F *11/00*

U.S. Cl. 222—327 **7 Claims**



1. Air compression means to apply air under pressure from a source thereof to a container of flowable material which container has a nozzle through which said material may be discharged, comprising

a valve assembly with an inlet port connectable to an air source, said valve assembly incorporating a three-way valve, an actuator extending from said three-way valve for controlling the flow of air passing therethrough; a spring-biased pivoted lever for biasing said actuator to a normal position;

a gun unit including a handle, trigger means including a trigger arm pivoted in said handle; a flexible tension control cable connecting said trigger arm and said pivoted lever for activating said actuator away from the normal position and into the actuated position when tension is applied to the said control cable; a holder fixed to the upper part of said handle; holding means for a said container adjustably and slidably mounted on said holder; a coupler on said holding means communicating with said container in the installed position of the container; a flexible air line connecting said three-way valve to said coupler; such that

the gun unit may be held in a hand of the user and controlled by pressure of a finger of said hand against said trigger means and with the valve assembly mounted at a remote location from the gun, in which

said three-way valve in the normal biased condition blocks the inlet port and connects the flexible air line to an exhaust outlet of the valve that leads to ambient air outside the valve under atmospheric pressure, and in which said three-way valve in the actuated condition blocks the said exhaust outlet and connects the inlet port to the flexible air line.

4,273,271

VOLUMETRIC DISPENSER

Howard L. Tiger, Eagle Ridge Way, West Orange, N.J. 07052

Continuation-in-part of Ser. No. 790,481, Apr. 25, 1977, abandoned. This application May 21, 1979, Ser. No. 40,725

Int. Cl.[3] G01F *11/26*

U.S. Cl. 222—454 **1 Claim**

1. A volumetric dispenser for dispensing measured increments of a liquid from a supply of the same, comprising in combination:

a housing having a closed top and adapted to be connected in communicating relation with a closed container containing a supply of liquid,

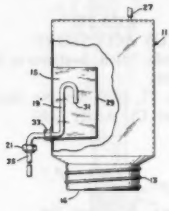
a dosage measuring receptacle disposed internally of said housing,

said dosage measuring receptacle having a closed bottom and an open top, and being fillable by inversion of said container and said housing followed by restoration thereof to their initial relative positions,

means defining a passage extending from a point inside said dosage measuring receptacle to a delivery point outside said container,

means completely disposed internally of said housing for adjusting the effective volume of said dosage measuring receptacle to a selected value, and

means independent of said dosage measuring receptacle and said means for adjusting the effective volume thereof and



external of said housing, f r relieving inequalities between the pressure of the ambient atmosphere and the pressure in the vapor space over the liquid in said container and in said dosage measuring receptacle,

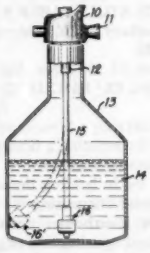
said means for adjusting the effective volume of said dosage measuring receptacle comprising a delivery tube disposed internally of said housing, said tube having a feed point selectively adjustable to a predetermined depth within said dosage measuring receptacle located below the surface of the liquid container therein, said tube establishing communication for the liquid with said passage defining means to the delivery point outside said container, and a pivotal liquid-tight connector joining said tube with said passage defining means.

4,273,272

LIQUID DISPENSER

Max A. Blanc, 5 Rue du Pilori, 64 100 Bayonne, France, assignor to William B. Anderson, West Palm Beach, Fla. and Max Alain Blanc, St. Jean de Luz, France, part interest to each

Filed Nov. 13, 1979, Ser. No. 93,381
Int. Cl.³ B67D 5/60
U.S. Cl. 222—464 **5 Claims**



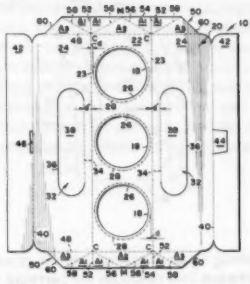
1. In a liquid dispenser in which a liquid is dispensed from a container through an upper discharge by means of a depending tube, the improvement of an intake fitting engageable with the lower end of the tube and comprising a passage through the intake fitting, a stop within said passage engageable by the lower end of the tube when it is inserted in the passage and constriction means within the passage and spaced above the stop for engaging the outer periphery of the tube to lock the fitting on the lower end of the tube, said intake fitting being relatively heavy in relation to the liquid which it displaces so that both it and the liquid can be displaced by gravity to the same region within the container and with the lower end of the fitting positioned in the lower region of the liquid, said intake fitting including a tubular formation of relatively lightweight material having a passage extending therethrough, an annular weight slidably engageable onto the upper end of the tubular formation, a support outwardly extending from the tubular formation for the support of the annular weight, a depending portion of the tubular formation beneath said support, a lower end of the passage passing through the depending formation and an upwardly and outwardly shaped outer surface formed on said depending formation surrounding the lower end of the passage.

4,273,273

HAND CARRIER FOR CANS OR BOTTLES

Hideomi Zenri, No. 32-12, 2-chome, Kaminakazato, Kita-ku, Tokyo, Japan

Filed Jul. 17, 1978, Ser. No. 925,164
Claims priority, application Japan, Feb. 8, 1978, 53-13246
Int. Cl.³ B65D 71/00
U.S. Cl. 294—87.2 **7 Claims**



1. A hand carrier made of a thick sheet for carrying cans or bottles by gripping their circumferential projections, characterized in comprising:

a bottom wall **(22)** and two side walls **(24)** provided one along either side of the bottom wall **(22)** via first scoring lines **(23)**,

at least one circular gripping hole **(18)** provided in the bottom wall **(22)** for gripping a can or bottle and having a smaller diameter than that of the circumferential projection **(27)** of the can or bottle to be carried,

a second circular scoring line **(28)** formed concentrically with each of the circular gripping holes **(18)** and having a diameter larger than that of the circumferential projection **(27)** of the can or bottle to be carried,

an annular region **(26)** defined between the circular gripping hole **(18)** and the second circular scoring line **(28)** and being transformable into a frustoconical gripper upwardly extending from the second circlar scoring line **(28)** simultaneously with the insertion of the can or bottle into the circular gripping hole **(18)** from the underside of the bottom wall **(22)**, the frustoconical gripper being engageable with and tightly gripping the circumferential projection of the can or bottle from the underside thereof,

reinforcing ear portions **(50)** provided one on each end of the bottom wall **(22)** and the side walls **(24)** via additional scoring lines **(48)**,

the configuration of the reinforcing ear portion **(50)** being an isosceles trapezoid having its base on the additional scoring line **(48)**, each reinforcing ear portion **(50)** having further scoring lines **(52)** lying on the extensions of the first scoring lines **(23)**, mid scoring lines **(56)** connecting the mid point **(M)** of the outer edge **(54)** of the ear portion

(50) and two intersecting points, (C, C) of the first and the additional scoring lines (23) and (48), and lateral scoring lines (58) symmetrical with the mid scoring lines (56) with respect to the further scoring lines (52), and

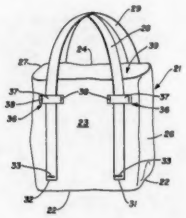
first triangular shaped portions (A_1) defined by said further mid and lateral scoring lines (52, 56 and 58) and the outer edge (54) of the ear portions (50) being bent inwardly, and second triangular portions (A_2) defined by said additional and further scoring lines (48 and 56) and third triangular portions (A_3) defined by said additional and lateral scoring lines (48 and 58) and oblique line (60) of the ear portions (50) being bent substantially normal to the bottom wall (22) and the side walls (24), when the hand carrier is folded into its usable form.

4,273,274

CONVERTIBLE HANDBAG AND BACKPACK

Margo S. Freistadt, 670 Greenwich St., San Francisco, Calif. 94133

Filed Jun. 7, 1979, Ser. No. 46,358
Int. Cl.³ A45C *13/26*
U.S. Cl. 294—141 **2 Claims**



1. A bag having a pair of carrying straps mounted thereto for movement between two positions for carrying of said bag as a handbag, a shoulder bag and a backpack; said bag including a bag body having a bottom panel, opposite side panels and opposite end panels, said bottom panel being elongated and said side panels each having a greater transverse dimension than the transverse dimension of said end panels; a first carrying strap having a first end secured to a first side panel proximate said bottom panel and proximate a first end panel; a second carrying strap having a first end secured to said first side panel proximate said bottom panel and proximate a second end panel, said straps each extending upwardly along said first side panel over the top of said bag and terminating in a second end secured to a second side panel; and mounting means slidably mounting each of said straps to said first side panel proximate the top of said bag, said straps each being unattached to said first side panel intermediate said mounting means and said first ends; wherein the improvement in said bag comprises:

said side panels and said end panels terminating in and defining an open bag top;

said bag body being formed of a flexible material proximate said open bag top;

said mounting means being further secured to said first side panel to position an intermediate portion of said first strap proximate said first end panel and an intermediate portion of said second strap proximate said second end panel;

said straps extending from said mounting means and crossing over said open bag top along substantially diagonally extending lines with said second end of said first strap being secured to said second side panel proximate said second end panel and said second end of said second strap being secured to said second side panel proximate said first end panel; and

said straps being secured to said bag body and slidably mounted by said mounting means for movement between a first position at which the crossed straps:

(i) may be gripped by the hand of the user for carrying as a handbag, and

(ii) define an opening over said open bag top lying in a plane parallel to said side panels through which the arm and shoulder of the user may be inserted for carrying of the bag as a shoulder bag, and

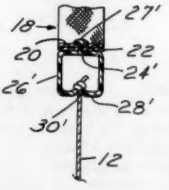
a second position at which the crossed straps are pulled down over and hold closed said open bag top by pulling said flexible material proximate said bag top together, said straps in said second position being slid down through said mounting means to enable insertion of the arms of the user between said straps and said first side panel for carrying of said bag as a backpack.

4,273,275

TOY ACCESSORY

Kenneth Vadnais, Livonia, Mich., assignor to S & S Industries, Inc., Wyandotte, Mich.

Filed Apr. 17, 1979, Ser. No. 30,832
Int. Cl.³ A63H *1/30*
U.S. Cl. 224—101 **3 Claims**



1. A finger ring comprising a flexible strap, having first and second portions, one of said portions having a plurality of hooks and the other portion having a plurality of loops adapted to engage said hooks to form an adjustable loop, a cup attached to the strap and having the cup bottom extending outwardly from the strap, a hole formed in the bottom of the cup, the hole having a substantially conical configuration with the larger portion of the cone being located furtherest from the strap, the inner portion of the cone being rolled, the hole being sized to allow passing of a string therethrough and the cup being sized to retain a knot formed in the string within the cup and away from the strap the knot being free to rotate within the cup to form a swivel.

4,273,276

HOLSTER WITH ADJUSTABLE SAFETY STRAP

Neale A. Perkins, Bradbury, Calif., assignor to Safariland Ltd. Inc., Monrovia, Calif.

Filed Nov. 30, 1979, Ser. No. 98,984
Int. Cl.³ F41C *33/02*
U.S. Cl. 224—243 **10 Claims**

1. In a holster for carrying a firearm and comprising a case having a safety strap for securing a firearm in the case, and a snap ring fastener element secured to a wall of the holster adjacent the case for use in holding the safety strap over the firearm, the improvement comprising:

a reinforcing member overlying the wall of the holster and having an elongated opening that registers with a similar elongated opening in the wall of the holster;

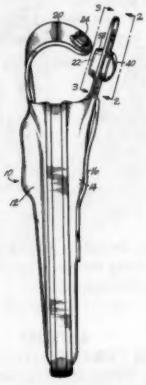
means securing the reinforcing member in a fixed position on the wall of the holster so the two elongated openings register with each other;

a snap ring fastener element adjacent the wall of the holster on a side thereof opposite the reinforcing member;

an attachment element facing the registered elongated openings in the reinforcing member and the wall of the holster; and

fastening means engaging the attachment element to releasably secure the snap ring fastener element to the wall of

the holster, the fastening means being releasable from the attachment element for moving the snap ring fastener element to a selected position along the length of the



registered elongated openings, the fastening means being securely fastened to the attachment memeber to rigidly hold the fastener element in the selected position.

4,273,277

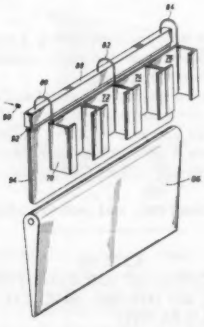
VISOR-CONNECTED TAPE CARTRIDGE HOLDER

H. Spencer Stone, 10816 Long Shadow, Houston, Tex. 77024

Division of Ser. No. 913,806, Jun. 8, 1978, abandoned. This application Sep. 27, 1979, Ser. No. 79,376

Int. Cl.³ B60R *7/04*; B65J *3/00*

U.S. Cl. 224—312 **4 Claims**



1. A holder for attaching to a vehicle sun visor and holding at least one tape cartridge therein, comprising

a plastic clamp segment for lying adjacent the top of the visor, said segment including oppositely aligned, upwardly and inwardly turned wedging end pieces attached to said base portion, the dimension between said inwardly turned end pieces and said base portion accepting the tape cartridge, and

accommodating clamping means connected to said base portion to permit attaching of the holder to sun visors of varying thicknesses, and

a sun screen attached to said clamping means on the underneath side of the visor for position pivoting independently of the visor.

4,273,278

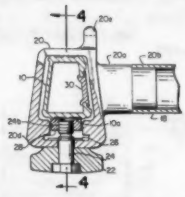
ADJUSTABLE LUGGAGE RACK

Manfred Storm, Cheshire, Conn., assignor to Oliver Industries, Inc., New Haven, Conn.

Filed May 7, 1979, Ser. No. 36,678

Int. Cl.³ B60R *9/04*

U.S. Cl. 224—321 **10 Claims**



1. A luggage rack for a vehicle roof or the like comprising a pair of spaced parallel side rails of generally tubular cross section, stanchion means supporting said side rails above the vehicle roof, at least one cross bar extending between said side rails, cross bar end fittings with portions encircling said tubular side rails and each end fitting having a projecting portion fixedly secured to the associated end of a cross bar, a side rail clamping device rotatably mounted in the lower side of each cross bar end fitting portion encircling said side rail, each of said devices including a threaded portion and a member threadably received thereon for acting against the underside of said side rail in response to rotation of said clamping device.

4,273,279

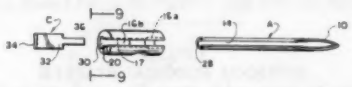
HIGH STRENGTH NEEDLE ASSEMBLY WITH SHARPENABLE CUTTING EDGE

Steven Kunreuther, 285 Central Park W., New York, N.Y. 10024

Filed Jul. 9, 1979, Ser. No. 55,542

Int. Cl.³ B65C *7/00*

U.S. Cl. 227—67 **25 Claims**



1. A needle assembly for use in a fastener attacher or the like comprising a shank part and a base part, said base part being adapted to be removably received in the fastener attacher, said shank part and said base part being independently fabricated, said shank part comprising a tip portion and a substantially cylindrical hollow portion having an inner and an outer diameter, said base part comprising a central bore having first and second sections, said first section having an inner diameter substantially equal to the outer diameter of said cylindrical portion so as to permit insertion of said cylindrical portion therein, said second section having an inner diameter substantially equal to the inner diameter of said cylindrical portion, and adhesive means for non-removably securing the outer surface of said cylindrical portion to the inner surface of said first section.

4,273,280

MACHINE FOR THE ATTACHMENT OF RIVETS, BUTTONS OR THE LIKE ON CLOTHING PIECES

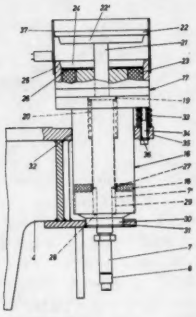
Herbert Birkhofer; Gunther Diekhoner, and Hans-Otto Hoffler, all of Brunswick, Fed. Rep. of Germany, assignors to Schaeffer-Homberg GmbH, Wuppertal, Fed. Rep. of Germany

Filed Jun. 14, 1979, Ser. No. 48,565

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1978, 2826417

Int. Cl.³ A41H *37/04*

U.S. Cl. 227—107 **9 Claims**



1. In a machine for the attachment of rivets, buttons or the like on clothing pieces, with an upper tool to be moved onto the lower tool, which upper tool is mounted on a vertically guided upper tool ram with electrical drive, the improvement comprising

two different strength electromagnets being operatively coordinated to the upper tool ram,

means for spring-biasing said upper tool ram in a reverse run direction,

said upper tool ram being formed with a cross-sectionally smaller step,

the weaker of said electromagnets being disposed in the range of said cross-sectionally-smaller step of said upper tool ram and surrounding said upper tool ram in a ring-like manner,

the stronger of said electromagnets has a core, said core forming a pot-shaped core recess,

a plate armature being arranged on a free end of said upper tool ram, said plate armature being operatively insertable into said core recess,

said core recess is defined by a bottom surface,

a shock absorber plate is disposed on said bottom surface.

4,273,281

INTERNAL SURGICAL STAPLER

Lawrence M. Smith, and G. Marts Acker, both of Lake Oswego, Oreg., assignors to Franklin G. Smith and Jerome F. Moshofsky, part interest to each

Filed Jul. 23, 1979, Ser. No. 59,941

Int. Cl.³ B25C *5/11*

U.S. Cl. 227—152 **4 Claims**

1. In an improved internal surgical stapler,

holding means for holding a staple;

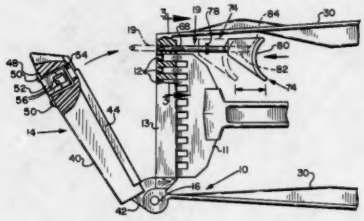
anvil means hinged to the holding means for clinching the staple and being movable between an open position and a clamping position clamping layers to be stapled together;

a latching pin;

latching means carried by the anvil means;

means mounting the latching pin on the holding means for forward movement from a retracted position to a latching position engaging the latching means when the anvil means is in its clamping position; and

manually operable release means for effecting unlatching of the pin and the latching means,



the release means including means for turning the pin relative to the latching means, wherein the pin and the latching means are disengageable.

4,273,282

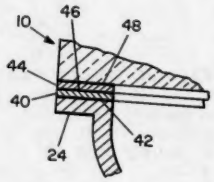
GLASS-OR CERAMIC-TO-METAL SEALS

Gordon S. Norvell, Thousand Oaks, and Donald W. King, Pomona, both of Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Dec. 20, 1979, Ser. No. 105,759

Int. Cl.³ B23K *20/24*

U.S. Cl. 228—116 **10 Claims**



1. A process for vacuum tight sealing a metal surface to a second surface chosen from the class consisting of glass or glass-ceramic surfaces comprising:

attaching a layer of gold to said metal surface;

placing a layer of indium over said layer of gold;

heating said gold and indium above the melting point of indium to form a gold-indium alloy at the interface between said gold and indium;

cooling; and

pressing said indium onto said second surface.

4,273,283

AUTOMATIC AIR REGISTER

Allen W. Edwards, 405 Hyacinthe Blvd., T.H. 3, Mississauga, Ontario, Canada (L5A 3N1)

Continuation-in-part of Ser. No. 838,734, Oct. 3, 1977, Pat. No. 4,151,952. This application Nov. 3, 1978, Ser. No. 957,545

Claims priority, application Canada, Sep. 16, 1977, 286878; United Kingdom, Feb. 15, 1977, 6316/77

Int. Cl.³ F24F *7/00;* E05F *15/20*

U.S. Cl. 236—49 **11 Claims**

1. An air register comprising:

housing means defining a flow path for air from an air duct,

louvre means in the housing means for closing and opening said flow path,

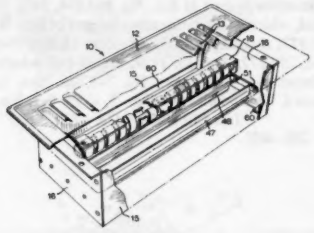
a crank arm connected to said louvre means and adapted upon rotation to adjust the louvre means,

a shaft mounted for rotation with respect to said housing means,

a bi-metallic, temperature-sensitive element connected to said shaft and mounted with respect to the housing means

such that it can regulate the angular orientation of the shaft with respect to the housing means,

and a lever connected to said shaft and disposed perpendicular thereto, the lever having a slot in which part of said crank arm is captive, the slot including at least one portion disposed such that when said part of the crank arm is located therein the crank arm is caused to rotate when the lever rotates,



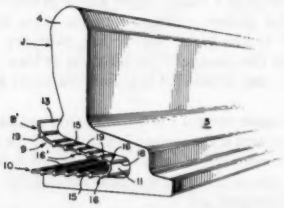
said housing means supporting a pivotal but stiffly mounted adjustable member adjacent said lever, the adjustable member having a projection extending through the plane of rotation of the lever and being located to one side thereof, whereby rotation of the adjustable member in one sense can bring the projection into contact with the lever and thus retain the lever in a position for which the louvre means is in an extreme condition.

4,273,284

INSULATED RAIL JOINT

Thomas N. Hannigan, Chicago, Ill., assignor to Portec, Inc., Oak Brook, Ill.

Filed Jul. 21, 1978, Ser. No. 926,968
Int. Cl.³ E01B *11/54, 11/10*
U.S. Cl. 238—160 **5 Claims**



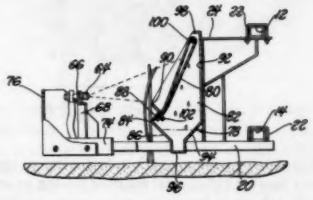
1. An insulated rail joint including, a pair of adjacent longitudinally aligned rail sections each having a web and a base flange, a joint bar provided with an upright disposed in laterally spaced-apart relationship adjacent said two rail webs and a foot disposed in vertically spaced-apart relationship adjacent said two rail flanges, an insulative base piece intermediate said joint bar foot and adjacent rail base flanges, said base piece of resilient deformable composition and including an integral central web extending throughout its lateral extent, a plurality of integral ribs projecting from opposite surfaces of said central web and engaging said joint foot and adjacent rail base flanges respectively, said ribs being parallel and oppositely disposed one another, said ribs extending longitudinally of said base piece, rail sections and joint bar, adjacent ones of said ribs well spaced laterally from one another to define a groove therebetween, and said base piece void of additional fastening means for immobilizing said base piece relative said joint bar and rail base flanges, whereby reduction of said space between said joint bar foot and adjacent rail base flanges during installation of said joint bar compresses and deforms said ribs to enhance retention of said base piece in said rail joint during travel thereover.

4,273,285

WEED SPRAYING ASSEMBLY

Sylvanus L. Scholbrock, Marion, Iowa, assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Jul. 25, 1979, Ser. No. 60,637
Int. Cl.³ B05B *1/28*
U.S. Cl. 239—121 **30 Claims**



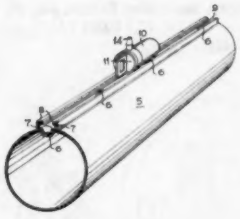
1. A spraying assembly comprising; support means adapted for attachment to a vehicle, spray means supported on said support means for spraying liquid generally horizontally in a predetermined pattern, collector means supported on said support means and having a spray-receiving opening and liquid catch basin below said opening, and permeable means supported by said collector means in said opening and at an acute angle relative to said spray pattern for receiving the liquid spray and allowing the liquid to permeate therethrough and collect in said catch basin.

4,273,286

CONDUIT FOR DRIP IRRIGATION SYSTEMS

Stanley W. O. Menzel, Sydney, Australia, assignor to RIS Irrigation Systems, El Cajon, Calif.

Filed Nov. 20, 1978, Ser. No. 962,111
Claims priority, application Australia, Nov. 29, 1977, PD2595
Int. Cl.³ B05B *15/00*
U.S. Cl. 239—272 **10 Claims**



1. A conduit for drip irrigation systems formed of an extrudable plastic material which conduit comprises:

(a) a tube having a wall of a selected thickness for conveying pressure fluids,

(b) the wall of said tube having a series of inwardly formed dimples along the length of the said tube, said dimples being pierceable by a piercing member by rupturing an inner part of the said dimples to leave the ruptured dimple wall in pressure contact with a said piercing member, and

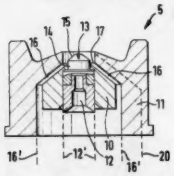
(c) outwardly formed stiffening ribs extending along the said conduit immediately on each side of the said dimples whereby the dimples are positioned in a channel extending along the said conduit.

4,273,287

ATOMIZER HEAD FOR PAINT SPRAY GUNS

Willi Huber, Altstätten, Switzerland, assignor to J. Wagner AG, Fed. Rep. of Germany

Filed Aug. 20, 1979, Ser. No. 68,220
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1978, 2841384
Int. Cl.[3] B05B *7/08*
U.S. Cl. 239—299 7 Claims



1. An improved paint spray nozzle having an outer housing, a centrally located cylindrical member having an upper conical surface on which is located a paint spray orifice having an essentially elliptical cross-section, operable to form a fan-shaped paint spray, a paint input port flow connected to the spray orifice, and a compressed air input port, the improvement comprising:

a first and a second compressed air output orifice flow connected to the compressed air input port;

said two orifices having a selected shape and being disposed, in spaced apart relationship on opposite sides of the cylindrical member supporting the spray orifice and located a selected distance upstream of an outer edge of the upper conical surface, at a selected acute angle with respect to a longitudinal axis of the cylindrical member;

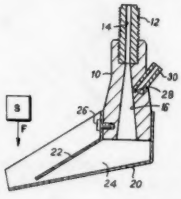
said two air output orifices cooperating with the cylindrical member and the upper conical surface to form a screen of air, having essentially an elliptically shaped cross-section fully enclosing the fan-shaped spray.

4,273,288

DISPENSING HEAD FOR BEVERAGES

Jean Lagneaux, Bourg Argental, France, assignor to Societe Generale pour l'Emballage, France

Filed Jul. 27, 1979, Ser. No. 61,332
Claims priority, application France, Jul. 28, 1978, 78 22483
Int. Cl.[3] F23D *11/16*
U.S. Cl. 239—419.3 9 Claims



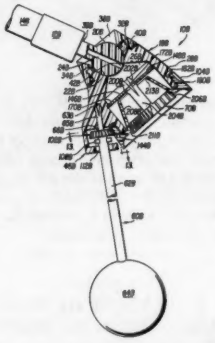
1. A dispensing head for dispensing beverages made from a concentrate and a diluting liquid, including a spout comprising a tubular element having input and output orifices for the diluting liquid, the cross-section of the bore of the tubular element increasing progressively from the input to the output orifice, a deflector arranged below said output orifice arranged to conduct liquid from the output orifice in a direction slightly inclined from the horizontal and discharge the liquid from an opening, a grid fixed within the deflector to distribute the flow of diluting liquid over the width of the deflector, and means for passing a stream of liquid concentrate in a substantially vertical direction downstream of said opening so that the stream of concentrate and the liquid discharged from the opening intersect.

4,273,289

SHOWERHEAD SPRAY TEXTURE CONTROL

Emile Jette, 1328 NE. 110 Ter., Miami, Fla. 33161

Continuation-in-part of Ser. No. 863,694, Dec. 20, 1977, abandoned, which is a continuation-in-part of Ser. No. 818,441, Jul. 25, 1977, abandoned, which is a continuation-in-part of Ser. No. 790,277, Apr. 25, 1977, abandoned, which is a continuation-in-part of Ser. No. 743,766, Nov. 22, 1976, abandoned. This application Jan. 9, 1978, Ser. No. 868,200
Int. Cl.[3] B05B *1/18, 1/32*
U.S. Cl. 239—458 23 Claims



1. A showerhead comprising, in combination:

(a) a main housing having a longitudinal passage therethrough with inlet and outlet ends;

(b) means for connecting the main housing at the inlet end of the passage to a water supply line to permit substantially universal pivotal movement of the main housing with respect to the water supply line, whereby water flow through the passage is permitted in at least one pivoted position and terminated in at least one other pivoted position;

(c) an elongate control rod having a first end carried by the main housing and a second free distal end for pivoting the main housing about its pivotal connection to the water supply line to control water flow through the passage and spray direction; and

(d) wherein the longitudinal axes of the control rod and flow passage diverge outwardly from the showerhead to locate the second free distal end at all times away from contact by water spray from the showerhead.

4,273,290

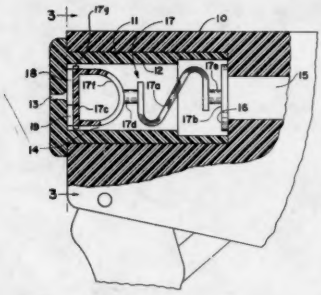
UNITARY VALVE AND SPRING ASSEMBLY

David R. Quinn, Pembroke Pines, Fla., assignor to The AFA Corporation, Miami Lakes, Fla.

Continuation of Ser. No. 851,227, Nov. 14, 1977. This application Nov. 9, 1979, Ser. No. 92,888
Int. Cl.[3] B05B *1/34*
U.S. Cl. 239—493 10 Claims

1. An assembly formed as a unitary molding including a sinuous spring member having opposite ends, a flat faced valve member connected to one of said opposite ends of said spring member and deployed transversely with respect thereto, a spin element comprising a flat plate deployed transversely with

respect to said spring member and connected to the other of said opposite ends of said spring and, an arched bridge connecting said spin element to said other opposite end of said spring member.



4,273,291

FUEL INJECTOR FOR INTERNAL COMBUSTION ENGINES

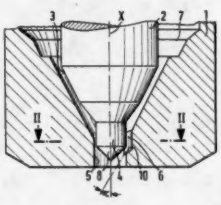
Eckart Müller, Schwabach, Fed. Rep. of Germany, assignor to Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Nuremberg, Fed. Rep. of Germany

Filed Nov. 15, 1978, Ser. No. 960,832

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1977, 2750928

Int. Cl.³ B05B *1/30*

U.S. Cl. 239—533.12 **8 Claims**



1. A fuel injector for internal combustion engines, which comprises in combination:

a nozzle body with a valve seat and having a wall including therewith a nozzle bore which is coaxial to the longitudinal axis of said nozzle body;

a nozzle needle which is axially displaceably arranged within said nozzle body and is provided with a valve seat, said valve seat of said nozzle needle being adapted to be lifted off said nozzle body in response to fuel pressure into an open position of said fuel injector, and being further adapted to have its valve seat rest against said nozzle body in a closed position of said fuel injector; and

a throttling pin forming a part of said nozzle needle and extending into said nozzle bore at least during said closed position of said fuel injector, said nozzle bore being provided with an eccentrically arranged gap at at least one point of its periphery, said gap being located transverse to the wall of the nozzle bore and being so arranged that during slow lifting of said nozzle needle from the valve seat there results change of direction of discharging fuel stream with increasing stroke lifting thereof,

said throttling pin extending into said nozzle bore at least during a portion of the lifting off of said valve seat of said nozzle needle from said nozzle body, said gap being a quadrangular recess.

4,273,292

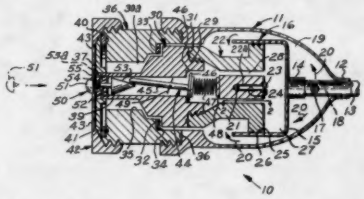
SELF-CLOSING SHOWER HEAD

Allen Neula, 27486 Verona Ave., Hayward, Calif. 94545

Filed Apr. 23, 1980, Ser. No. 143,082

Int. Cl.³ F16K *31/143*; B05B *1/02*

U.S. Cl. 239—562 **1 Claim**



1. A self-closing shower head, comprising, in combination, a hollow main body, a hollow cylinder secured in said hollow main body, a plunger slidably received in said hollow main body, for using water pressure in said hollow cylinder to advance said plunger onto a seat in a sleeve secured in said hollow main body, an externally threaded inlet water pipe threaded into a neck portion integral of the end wall of said hollow cylinder, said inlet water pipe being threadingly received in the neck portion of said hollow main body, and a pair of transverse openings through said water pipe enables water to flow into said hollow main body around the outer periphery of said hollow cylinder and the outer periphery of a portion of said plunger, and a transverse opening through said plunger receives the water, and the flow is metered by an adjustable needle valve threadingly received in a fluted opening included on the longitudinal axis of said plunger, and said needle valve intersects with the transverse opening through said plunger, for adjustably restricting the water flow.

4,273,293

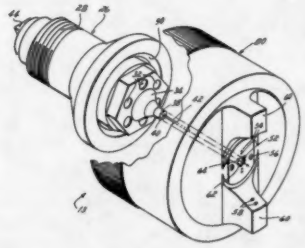
NOZZLE ASSEMBLY FOR ELECTROSTATIC SPRAY GUNS

Donald R. Hastings, Elyria, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed Dec. 20, 1978, Ser. No. 971,514

Int. Cl.³ B05B *5/02*

U.S. Cl. 239—705 **7 Claims**



1. In a system for the coating of articles with a liquid coating material supplied from a pressurized bulk coating source wherein said liquid coating material is emitted from a coating material spray device in the form of an atomized spray produced by impacting a central stream of liquid coating material under pressure with a pressurized gas stream encircling said central liquid stream and wherein the articles to be coated are spaced from said spray device, the combination comprising:

a source of liquid coating material under pressure;

a source of pressurized atomizing gas;

a material spray device having a liquid conduit with flow control means therein adapted to be connected to said

source of pressurized liquid coating material for providing relatively low liquid coating material flow rates in the approximate range of 1½–6 fluid ounces of material per minute, and having a gas conduit therein adapted to be connected to said source of pressurized atomizing gas; and

a spray coating nozzle assembly made which is substantially constructed of nonconductive plastic material comprising a liquid tip communicating with said liquid conduit and having a nozzle portion through which said liquid coating material is emitted in a central stream at said relatively low flow rate, and an air cap communicating with said atomizing gas conduit through which gas is ejected for impinging and atomizing said central stream of liquid coating material emitted from said nozzle portion of said liquid tip, said air cap being positionably supported by said spray device only in the rear region of said air cap to effectively leave the forward region thereof positionably unsupported by said spray device, said air cap having a central bore and a plurality of circumferentially spaced holes aligned with the axis of said central bore and intersecting the edge thereof defining a plurality of circumferentially spaced axial gas flow passages with spaced, radially inwardly extending ribs therebetween, said ribs engaging the outside surface of said liquid coating tip nozzle portion to positively align the center axis of said liquid coating nozzle portion on said axis of said central bore to provide uniform atomizing gas flow around said liquid coating tip nozzle portion for producing at said relatively low flow rate a finely atomized uniform spray pattern of said coating material emitted from said liquid tip.

4,273,294

METHOD AND APPARATUS FOR CRYOGENIC GRINDING

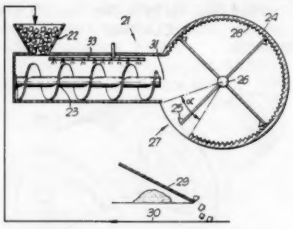
David J. E. Hollely, Misterton, near Doncaster, and Norris W. Shepherd, Worksop, both of England, assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed May 31, 1979, Ser. No. 44,296

Claims priority, application United Kingdom, Mar. 15, 1979, 09168/79

Int. Cl.³ B02C *13/288*

U.S. Cl. 241—18 **10 Claims**



1. A method of cryogenically grinding pieces of material, with substantially less consumption of cryogenic refrigerant than heretofore required, comprising the steps of:

(a) pre-cooling the pieces of material to be ground in counter-current heat exchange with a cold gaseous cryogenic refrigerant,

(b) further cooling and embrittling the pre-cooled pieces of material in direct contact with a liquid cryogenic refrigerant, and thereby vaporizing said liquid cryogenic refrigerant and generating said cold gaseous cryogenic refrigerant,

(c) continuing said cooling and embrittling step for a sufficient contact time to thoroughly embrittle said pieces throughout,

(d) introducing said thoroughly embrittled pieces of material through an inlet of a rotary impact mill,

(e) passing said thoroughly embrittled pieces of material through said mill in an arcuate path comprising more than 270° of travel through said mill,

(f) discharging on the first pass through said mill at least 70% of the entering embrittled material through a nonscreened discharge opening subtending an angle of between 5° and 60°, and

(g) restricting the flow of said cold refrigerant gas which is discharged from said mill to a sufficient degree to cause the majority of said cold gaseous refrigerant which is generated to flow in counter-current heat exchange with said pieces of material according to step (a).

4,273,295

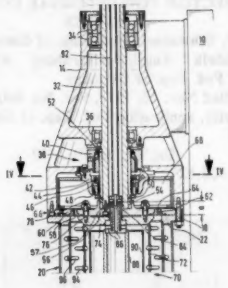
AGITATOR MILL

Josef Pöllmann, Lorenzreuth, Fed. Rep. of Germany, assignor to Gebruder Netzsch, Maschinenfabrik GmbH & Co., Fed. Rep. of Germany

Filed Apr. 4, 1979, Ser. No. 26,853

Int. Cl.³ B02C *23/10*

U.S. Cl. 241—46.11 **9 Claims**



1. An agitator mill for the continuous processing of grinding stock comprising

a stand,

a bearing housing arranged on said stand and having at least one bearing,

a drive shaft which turns in said at least one bearing of said bearing housing,

a detachable grinding chamber attached to said bearing housing having a grinding stock intake and containing grinding stock as well as grinding bodies,

a detachable agitator shaft coupled to said bearing housing and reaching into said grinding chamber where it includes at least one agitating element carried on said shaft,

a discharge chamber situated between said grinding chamber and said at least one bearing,

and a separation system arranged between said grinding chamber and said discharge chamber including

a separator ring rotating together with said agitator shaft,

a stationary ring attached to said bearing housing,

a separation slit between the two said rings to permit the processed grinding stock to flow through but to retain the grinding bodies,

characterized by the fact that said rotating separator ring **(56)** is attached to said drive shaft **(32)** independently of said agitator shaft **(70)** which is also attached to said drive shaft **(32)** and that said agitator shaft **(70)** in the region between said grinding chamber **(20)** and said at least one bearing **(36)** situated in said bearing housing **(14)** is detachable from said drive shaft **(32)** while said separator ring **(56)** remains attached to said drive shaft **(32)**.

4,273,296

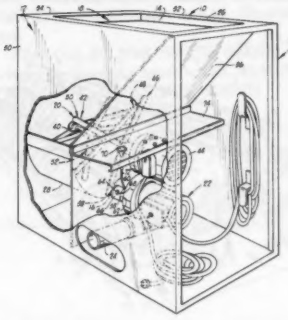
MATERIAL MOVING APPARATUS

Tom C. Hoshall, 4005 N. Penn., Oklahoma City, Okla. 73112

Filed Apr. 13, 1979, Ser. No. 29,642

Int. Cl.³ B02C *13/10*

U.S. Cl. 241—60 **12 Claims**



1. A material moving apparatus, comprising:

a hopper having an upper end and a lower end, a material receiving opening being formed in the upper end, the hopper having a chamber and a material discharge opening, material being dischargable into the chamber through the material receiving opening and the material being movable from the chamber through the material discharge opening, the lower end portion of the hopper being formed on a radius;

a hopper blade assembly disposed in the hopper chamber for shredding the material discharged into the hopper chamber, the hopper blade assembly cooperating to shred the material and cooperating to move the material from the hopper chamber through the material discharge opening, comprising:

a shaft rotatably mounted and extending through a portion of the hopper chamber;

at least two blades, each blade being connected to the shaft and extending a distance radially therefrom terminating with an outermost end; and

means to rotatingly drive the shaft, thereby rotating the blades within the hopper chamber, the lower end portion of the hopper being formed on the radius and shaped to provide a minimum clearance between the outermost ends of the blades of the hopper blade assembly and the lower end portion of the hopper;

a blower assembly for receiving substantially all of the material discharged through the hopper material discharge opening and forcibly discharging the received material through a blower discharge; and

a discharge conduit connected to the blower discharge and receiving substantially all of the material discharged from the material discharge opening, substantially all of the material being discharged from the material moving apparatus via the discharge conduit.

4,273,297

APPARATUS FOR CRUSHING FRANGIBLE ARTICLES

John H. T. Rinfret, and Elizabeth M. Rinfret, both of The Grange, West Ashby, Horncastle, Lincolnshire, England

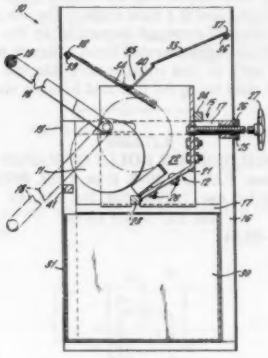
Filed Jul. 24, 1979, Ser. No. 60,025

Claims priority, application United Kingdom, Jul. 26, 1978, 31168/78

Int. Cl.³ B02C *1/00*

U.S. Cl. 241—99 **7 Claims**

1. Apparatus for crushing frangible articles comprising a housing; a support plate mounted within the housing, said support plate including a planar surface for supporting articles to be crushed; a crushing member having a crushing surface portion mounted in the housing; means for rotating said crushing member about an axis generally parallel to said planar portion of the support plate such that, in use, rotation of the crushing member about the axis moves said surface portion of the crushing member in an arcuate path towards, along and away from the planar surface of the support plate to crush the



articles therein, a tangent to the path at one point being parallel to said planar portion of the support plate; and means connected to said support plate for moving said support plate towards or away from the crushing member to adjust the distance between the support plate and said tangent to the arcuate path.

4,273,298

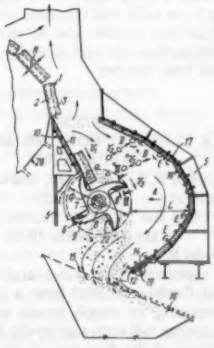
APPARATUS FOR CRUSHING AGGLOMERATED MASS

Ivan K. Boriskin, ulitsa Kutuzova, 10, kv. 29, Novokuznetsk; Jury S. Bragin, Chernogorsky bulvar, 9, kv. 18, Moscow; Mikhail S. Bykov, ulitsa Kirova, 3, kv. 38, Novokuznetsk; Valentin I. Gubanov, prospekt Metallurgov, 32, kv. 30, Novokuznetsk; Vladlen M. Ivanov, ulitsa Bardina, 36, kv. 164, Novokuznetsk; Eduard A. Tool, ulitsa Kirova, 50, kv. 62, Novokuznetsk, all of U.S.S.R.; Sergei V. Bazilevich, deceased, late of Moscow, U.S.S.R.; by Tatyana N. Bazilevich, administrator, ulitsa Kremenchugskaya, 9, kv. 53, Moscow, U.S.S.R.; Vitaly A. Sergeev, deceased, late of Novokuznetsk, U.S.S.R.; by Valentina I. Sergeeva, administrator, and by Elena V. Sergeeva, administrator, both of ulitsa Tolyati, 23, kv. 12, Novokuznetsk, U.S.S.R.

Filed Jul. 30, 1979, Ser. No. 62,176

Int. Cl.³ B02C *13/09*

U.S. Cl. 241—189 R **5 Claims**



1. An apparatus for crushing agglomerated mass comprising:

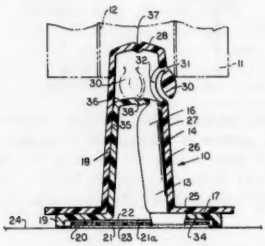
a housing having an outlet; a feed device including a chute for feeding said agglomerated mass into said housing; a rotatable rotor juxtaposed beneath said chute, having a shaft and formed with sprockets, and being located in said housing; said sprockets of said rotor being rigidly set in series on said shaft; said sprockets having crescent-shaped teeth with a work edge and with a concave surface thereof being arranged radially with respect to said rotor and having a T-shaped cross section with a web thereof arranged at a right angle to the axis of said rotor and a flange thereof arranged in parallel to the axis of said rotor, so that said agglomerated mass is struck by the work edge of said teeth as said rotor rotates into the path of the agglomerated mass being fed into said housing via said chute.

4,273,299

HOLDER FOR ROLLS OF PAPER

Virginia V. Ness, P.O. Box 1078, Ross, Calif. 94957

Filed Apr. 7, 1980, Ser. No. 138,149
Int. Cl.³ B65H *19/00*
U.S. Cl. 242—55.54 **9 Claims**



1. A two-piece paper towel roll holder, including in combination:

a stationary base member of high-impact plastic having an annular rim surrounding a central hollow projection, said rim having an upper surface on the same side as said projection,

a rotatable member of high-impact plastic having an annular rim surrounding a central hollow projection that nests around the outer surface of the hollow projection of said base member in surface engagement therewith and is rotatable with respect thereto, said rim having a lower surface facing the upper surface of said base member's rim, said projection of said rotatable member having a series of integral, yieldable, outwardly extending retention members, for firmly and non-rotatably engaging the hollow core of a paper towel roll, said retention members being connected to the remainder of said projection only by a springy web, a said projection having an opening radially inwardly from each said retention member,

whereby said base member can be secured to a stationary supporting surface and said rotatable member is rotatable about said base member.

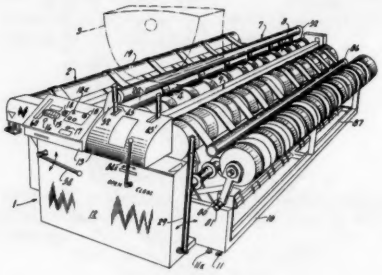
4,273,300

FLEXIBLE ELEMENT ROLLING AND HANDLING APPARATUS

Walter Wojtowicz, R.R. 4, Box 216, and Gust Mursau, Rte. 1, Box 390, both of Crivitz, Wis. 54114

Filed Jul. 30, 1979, Ser. No. 61,749
Int. Cl.³ B65H *19/20*
U.S. Cl. 242—56 R **18 Claims**

1. A reroll apparatus for selective reroll of a relatively wide elongated and flexible material from a storage roll of such material, comprising an unroll means adapted to rotatably support said storage roll with a generally horizontal rotational azis for unrolling of the free end of the material from said storage roll, a reroll means mounted in aligned parallel relationship to said axis of said storage roll as established by said unroll means and receiving the flap end of said material and engaging said material, said reroll means including a pair of roller means movable relative to each other to vary the spacing therebetween and a spacing guide means located below the roller means, belt means encircling said pair of roller means and said guide means and adapted to be located downwardly between said roller means to form a loop located below the



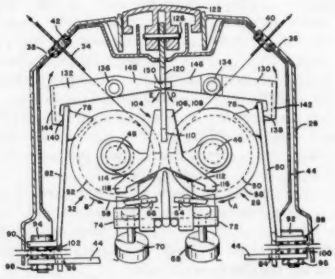
roller means with the roller means in a closed position and stretching outwardly between said roller means as said means move outwardly of each other, said material being movable downwardly into said loop portion and rerolled upon itself to initiate a rerolling of said material in response to movement of said belt means, and means to selectively lock said roller means in fixed relation to each other.

4,273,301

SEAT BELT RETRACTOR WITH EMERGENCY RELEASE AND REDUCED SPOOLING

John W. Frankila, Sterling Heights, Mich., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Apr. 2, 1980, Ser. No. 137,107
Int. Cl.³ B65H *75/48;* **A62B** *35/02*
U.S. Cl. 242—107.2 **20 Claims**



1. A seat belt retractor comprising:

seat belt storage means;

seat belt webbing stored on said storage means and adapted to be extracted from and rewound onto said storage means;

locking means operable to lock said retractor against movement in a direction permitting extraction of said webbing from said storage means;

release means actuatable for releasing said locking means; and

clamp means effective to limit withdrawal of said webbing from said storage means, and means responsive to actuation of said release means to render said clamp means

ineffective to limit withdrawal of said webbing from said storage means following actuation of said release means.

4,273,302

AIRCRAFT WITH COUNTERROTATING MEMBERS

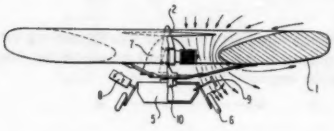
Heinz Jordan, Woelfnitz, Austria, assignor to Technische Geräte -u. Entwicklungsgesellschaft m.b.H, Woelfnitz/Klagenfurt, Austria

Filed Oct. 30, 1978, Ser. No. 956,005

Claims priority, application Austria, Oct. 31, 1977, 7749/77; Jun. 13, 1978, 4309/78; Jun. 13, 1978, 4310/78

Int. Cl.³ B64C *39/06*

U.S. Cl. 244—23 C **1 Claim**



1. A flying craft comprising a rotationally symmetrical supporting means for creating vertical lift in response to the movement of air over its upper surface, said supporting means having a cross section in the form of an airfoil profile, an inner driving unit coaxially arranged with said supporting means, said driving unit having a rotationally driven impeller portion and a base portion, said base portion being connected to said supporting means so as to rotationally drive the supporting means by the counter torque generated by the driving unit in a direction which is opposite to the rotating direction of the impeller portion, said driving unit being spaced from the supporting means to provide a gap therebetween, said driving unit being oriented and operated to draw air across the upper surface of the supporting means and impelling it downwardly through said gap whereby the movement of air across the upper surface of the supporting means provides said vertical lift, and a carrier, a shaft supported by ball bearings rotatably mounting the carrier in relation to the supporting means and to the driving unit, at least two steering flaps movable into the stream of air flowing through said gap, and at least one stabilizer which is located below the carrier, said steering flaps being pivotally mounted on a common frame, a plurality of rods each of which is associated with one of said flaps and is connected to its respective flap at a point spaced from the pivotal connection between the flap and the frame, a common adjusting ring operatively connected to each of said rods, said adjusting ring being rotatably mounted on and coaxial with the supporting means.

4,273,303

ADAPTIVE AIRPLANE LANDING GEAR

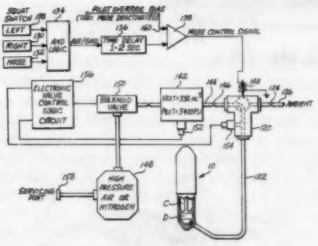
Paul T. Somm, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Mar. 16, 1979, Ser. No. 21,365

Int. Cl.³ B64C *25/58*

U.S. Cl. 244—104 FP **9 Claims**

1. A shock absorbing airplane landing gear strut comprising: a pair of cylinders sealingly and reciprocally mounted one within the other to provide hydraulic pneumatic containment, primary pneumatic means for directly acting on hydraulic fluid to urge the cylinders apart, means for hydraulic dampening of relative movement between the two cylinders during touchdown of an airplane, a compartment within one of the cylinders, a bottomed out piston sealingly and slideably mounted within the compartment with one side of the piston communicating with hydraulic fluid in the cylinders, a logic system initiated by landing having means for introducing secondary pneumatic pressure to the other side of the piston to drive said piston toward the primary pneumatic means, and the piston having valve means for closing off hydraulic fluid flow when in the bottomed out position and for opening to allow hydraulic fluid flow to provide a second and parallel hydraulic fluid



dampening means when the piston is used in response to the logic system.

4,273,304

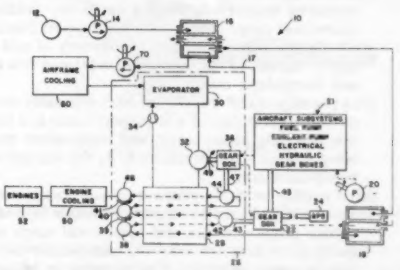
COOLING SYSTEM FOR HIGH SPEED AIRCRAFT

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration with respect to an invention of ; Pierce L. Lawing, 88 Columbia Dr., Newport News, Va. 23602, and LaVerne L. Pagel, 3013 Mamelle Dr., St. Charles, Mo. 63301

Filed Jan. 31, 1979, Ser. No. 8,210

Int. Cl.³ B64D *37/34;* B64C *1/40*

U.S. Cl. 244—117 A **16 Claims**



1. A cooling system for a high speed aircraft comprising:

an aircraft;

fuel means carried by said aircraft;

said aircraft having airframe cooling means;

heat pump means comprising evaporator and condenser means for receiving coolant medium from within said airframe cooling means and extracting heat therefrom in said evaporator means;

heat exchanger means for receiving fuel from said fuel means and receiving said coolant medium from said evaporator means and transferring heat from said coolant medium to said fuel said condenser means receiving fuel from said heat exchanger means for further heating of said fuel in said heat pump means; and,

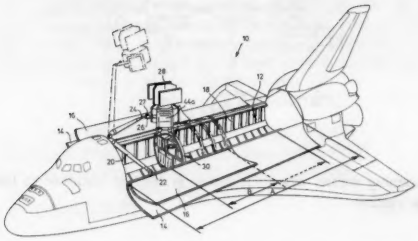
said heat exchanger means and said heat pump means arranged to maintain said airframe at low temperatures by transferring heat from said coolant medium to said fuel whie said aircraft is flying at high speeds.

4,273,305

SATELLITE SERVICING

Charles M. Hinds, Weston, Canada, assignor to Spar Aerospace Limited, Toronto, Canada

Filed Jul. 3, 1979, Ser. No. 54,829
Int. Cl.³ B64G 1/14
U.S. Cl. 244—158 R **19 Claims**



1. In a space shuttle orbiter having a cargo bay formed therein which has a longitudinal extent in a first direction, said orbiter being adapted to open to provide access to the cargo bay through an access passage extending along said cargo bay in said first direction, an improved satellite servicing system comprising:

(a) a remote manipulator assembly which includes a remote manipulator arm having a first end secured to the orbiter and a free end which may be moved in response to manipulation of the arm to be positioned at any required point with a predetermined operational range extending within and without said cargo bay for use in the capturing, deploying and servicing of satellites and the like,

(b) a combined satellite service and replacement module support assembly mounted in said cargo bay within said operational range of said arm, said support assembly comprising:

(i) a short generally planar support frame mounted in and extending transversely of said cargo bay within said operational range of said arm, said support frame having a support face extending transversely of said cargo bay on the side of the frame proximate said first end of said manipulator arm,

(ii) a plurality of replacement modules releasably mounted on said support face of said support frame in a side-by-side generally planar array, said replacement modules being accessible to and releasable by the free end of said manipulator arm,

(iii) a satellite servicing platform on said frame, said platform being adapted to support a satellite in a satellite service position within said operational range of said manipulator arm whereby the manipulator assembly may be operated to affect an interchange of modules between a satellite located on said platform and modules located on said support assembly.

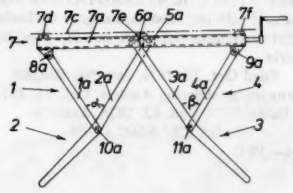
4,273,306

ADJUSTABLE-HEIGHT SUPPORT APPARATUS

Pek S. Chang, Flat No. 509, Lai Kit Lau, 38, Lai Tak Tsuen, Tai Hang, Hong Kong

Filed May 17, 1979, Ser. No. 39,863
Claims priority, application United Kingdom, Jun. 10, 1978, 26658/78
Int. Cl.³ F16M 13/00
U.S. Cl. 248—421 **9 Claims**

1. Adjustable-height support apparatus comprising a pair of leg supports, each leg support comprising a pair of spaced and interconnected legs and at least one strut pivotally connected to the legs intermediate their ends, elongate means in which one end of each leg is pivotally engaged, the positions of said one ends of the legs of the two leg supports being relatively adjustably positionable along said elongate means, the ends of the struts remote from the legs being pivotally mounted at fixed points relative to the elongate means, the legs of one leg support crossing the legs of the other leg support, actuating



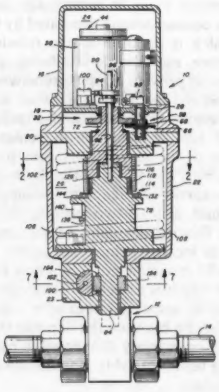
means operatively associated with said legs for moving the legs along the elongate means, and support means on the elongate means or on the opposite ends of the legs.

4,273,307

CLUTCH FOR VALVE ACTUATOR

Richard F. Malinski, Schaumburg, and John Sikorcin, St. Charles, both of Ill., assignors to Vapor Corporation, Chicago, Ill.

Filed Sep. 18, 1978, Ser. No. 943,576
Int. Cl.³ F16D 13/08; F03G 1/00
U.S. Cl. 251—69 **10 Claims**



1. In a rotary valve actuator of the type employing a drive motor, an energy storage spring between said drive motor and a valve providing powered rotation of an output shaft secured to said valve to a pre-determined valve position, and self-powered return to an original valve position, the improvement comprising:

a drive motor shaft axially aligned with and abutting a valve-operating shaft; a helical torsion spring surrounding at least a portion of said motor shaft and said valve operating shaft; said torsion spring including first and second ends, said first end affixed to said drive motor shaft, said spring exerting positive radial compression on at least a portion of the drive motor shaft;

means releasably attaching said second end to said output shaft;

wherein actuating said attachment means, and rotation of said drive motor shaft provides positive radial compression between said spring and output shaft to provide operational torque to turn said valve and wind said storage spring; and,

wherein release of said second end reduces said valve shaft

radial compression allowing opposite rotation of said valve shaft without input drive shaft movement.

4,273,308

ROTARY VALVE

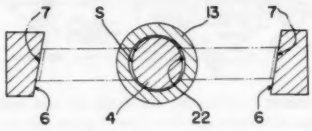
Osamu Nakai, Hirakata, Japan, assignor to Kubota, Ltd., Osaka, Japan

Filed Nov. 2, 1979, Ser. No. 90,716

Claims priority, application Japan, Nov. 4, 1978, 53/136020; Dec. 16, 1978, 53/155294

Int. Cl.³ F16K *25/00*

U.S. Cl. 251—88 **10 Claims**



1. A rotary valve comprising:

a housing having an inlet and an outlet;

bearing means supported on an axis of said housing;

a rotatable valve stem supported by said bearing means;

said rotary valve stem including bearing surfaces juxtaposed said bearing means;

a valve disc coaxially supported by said valve stem within said housing between said inlet and said outlet;

a valve seat supported by said housing in direct relationship with said valve disc and operative therewith for closing said valve; and

said valve stem bearing surfaces having an outer surface configuration which is different from the inner surface configuration of said bearing means in which one of said surface configurations is a circle and the other of said surface configurations is elliptic-oval shaped which forms a clearance between said valve stem bearing surfaces and said bearing means;

whereby said clearance between said valve stem bearing surfaces and said bearing means is greater in a direction perpendicular with the flow of fluid than in a direction parallel to the fluid flow.

4,273,309

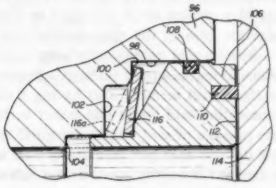
VALVE MECHANISM INCORPORATING UNIVERSAL SEAT SPRING

Bertram L. Morrison, Houston, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Mar. 15, 1979, Ser. No. 20,765

Int. Cl.³ F16K *25/00*

U.S. Cl. 251—174 **17 Claims**



1. A valve mechanism comprising:

a valve body defining a valve chamber and defining a flow passage intersecting said valve chamber, said valve body being formed to define at least one seat pocket within said valve body;

a valve element being positioned within said valve chamber and being movable between open and closed positions to control the flow of fluid through said valve mechanism;

a valve seat member being movably received within said seat pocket;

at least one of said seat pocket, valve element and seat member having tolerances varying between a maximum and minimum; and

a universal annular disc spring being located within said seat pocket, said disc spring being deformed by movement of said valve seat relative to said valve body from an initial substantially flat configuration to a yielded frusto-conical configuration and developing a spring force urging said valve seat into sealing engagement with said valve element, said disc spring being further deformed by further movement of said valve seat relative to said valve body in response to the pressure responsive movement of said valve element within said valve chamber, said disc spring being deformed beyond the elastic limits of the material thereof through at least a portion of the tolerance variation between said maximum and minimum to compensate for said tolerance variations, the spring force of said disc spring being within a preselected narrow band of spring force both within and beyond said elastic limits, whereby force exerted by said disc spring against said seat and hence against said valve element being within a predetermined range regardless of the degree of flexure of said disc spring.

4,273,310

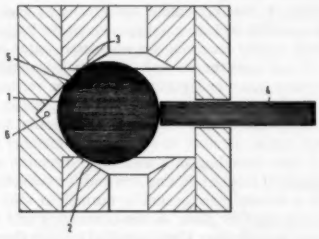
DEVICE FOR BLOCKING OR RELEASING FLUID FLOW

Peter Ginzler, Kaiser-Friedrich-Ring 67, Wiesbaden, Fed. Rep. of Germany

Filed Aug. 20, 1979, Ser. No. 67,862

Int. Cl.³ F16K *31/44, 15/00*

U.S. Cl. 251—211 **3 Claims**



1. A valve for controlling fluid flow therethrough, comprising

valve body means defining a cavity therein and first and second opposing fluid flow passages communicating with said cavity, for fluid flow between said first and second opposing fluid flow passages through said cavity, said valve body means further defining a first tapered metallic valve seat in said cavity surrounding said first fluid flow passage and a second tapered metallic valve seat in said cavity surrounding said second fluid flow passage, said valve body means further defining a conical recess in said cavity intermediate said first and second tapered valve seats, said recess having its central axis substantially perpendicular with respect to the direction of fluid flow between said first and second fluid flow passages,

a valve ball in said cavity for movement into sealing engagement with said first and second tapered metallic valve seats by fluid flow between said first and second fluid flow passages to prevent further fluid flow through said cavity,

a release bar extending through an opening in said valve body means opposite said conical recess, said release bar being slidably mounted for movement into said cavity in a direction substantially perpendicular to said fluid flow

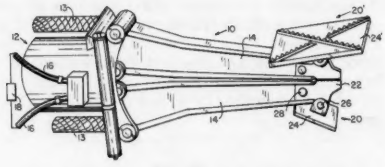
between said first and second opposing fluid flow passages to contact said valve ball and press said valve ball into said conical recess, thereby permitting fluid flow through said cavity and wherein said valve body means further defines a fluid passageway from said recess to said cavity to equalize pressure within said recess when said valve ball is positioned in said recess, thereby facilitating movement of said ball from said recess into engagement with said first or second tapered metallic valve seats upon movement of said release bar away from said recess.

4,273,311

RESCUE TOOL HAVING SPREADER PLATES

Gerald J. Rio, Hebron, Conn., assignor to Cranjer Company, Inc., Amston, Conn.

Filed Jan. 9, 1980, Ser. No. 110,764
Int. Cl.³ B66F *3/00*
U.S. Cl. 254—93 R **12 Claims**



1. In a portable fluid operated rescue tool having a body assembly including a pair of elongated force arms pivotally supported at the inner ends thereof on the body assembly for movement between retracted and spread positions, the arms being generally adjacent to each other in the retracted position and the outer ends of the arms being in spread apart relation to each other in the spread position, and fluid operated power means for moving the arms between the retracted and spread positions, the improvement comprising at least one spreader plate assembly including a support member having an inwardly opening cavity receiving an associated outer end portion of one of said arms therein and substantially complementing said associated outer end portion, means for releasably retaining said support member in connected engagement with said one arm, a spreader plate member, and means supporting said spreader plate member on said support member to pivot about a first axis extending in a transverse direction relative to the longitudinal axis of said one arm and for swivelling movement about a second axis generally normal to said first axis and including another plate, means connecting said spreader plate member to said other plate to swivel relative thereto about said second axis, and means connecting said other plate to said support member for pivotal movement about said first axis, said first axis being spaced longitudinally inwardly from the outer end of said one arm.

4,273,312

METHOD OF PROCESS OFF-GAS CONTROL

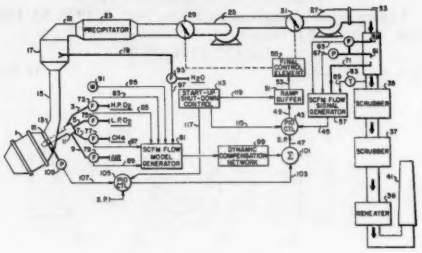
William R. Phillips, Jr.; Ronald D. Tate, both of Denver, and Radon Tolman, Evergreen, all of Colo., assignors to Dravo Corporation, Pittsburgh, Pa.

Filed Mar. 22, 1979, Ser. No. 22,770
Int. Cl.³ C22B *15/06*
U.S. Cl. 266—44 **11 Claims**

1. A method of controlling a process off-gas system in which a plurality of gases are generated in a process vessel in varying proportions during various stages of the process and are drawn through treatment equipment by fan means including a fan and means for controlling the capacity of the fan, said process comprising the steps of:

determining on a real time basis the actual flow rate of the off-gases down stream of the fan means by measuring the amount by percent volume of each of the major constituents present in the off-gases, measuring the temperature and pressure of said off-gases and using said amounts, pressure and temperature to generate the downstream actual flow rate which is the combined flow rate of said major constituents corrected for temperature and pressure,

generating a set point value for said downstream actual off-gas flow rate by measuring on a real time basis the



inputs of off-gas producing materials to the process vessel, and determining the flow rate of the off-gas that will be generated by the process as a function of the measured process inputs,

comparing the actual flow rate with a set point value for the flow, and

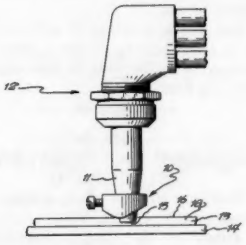
controlling the fan means to adjust the flow of off-gases to maintain the actual flow rate at the set point value.

4,273,313

GUIDE FOR A CUTTING TORCH

John M. DeNardo, 1044 Amherst St., Buffalo, N.Y. 14216

Filed Mar. 31, 1980, Ser. No. 135,294
Int. Cl.³ B23K *7/10*
U.S. Cl. 266—66 **5 Claims**



1. A guide adapted to be mounted on the nozzle marginal end portion of a cutting torch and used in association with a straight-edge for guiding the movement of said cutting torch along a workpiece, said guide comprising:

A member having an upper surface, a lower surface, and a side surface, said member also having a through passage communicating said upper and lower surfaces to accommodate passage of said nozzle marginal end portion, the surface on said member forming a wall of said passage being tapered inwardly toward said lower surface, said lower surface being configured as a convex cam in one direction and adapted to slidably engage said straight-edge; and

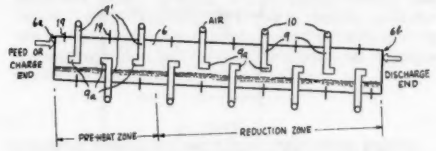
means mounted on said member for selectively holding said member to said nozzle marginal end portion;

whereby said cutting torch may be tilted to vary the spacing of said nozzle from said workpiece.

4,273,314
DIRECT REDUCTION ROTARY KILN WITH IMPROVED AIR INJECTION

Vitie P. Keran, and Alan C. Baker, both of Harriman, Tenn., assignors to The Direct Reduction Corporation, New York, N.Y.

Filed Jun. 22, 1979, Ser. No. 51,017
Int. Cl.³ F27B 7/36
U.S. Cl. 266—145 **10 Claims**



1. In a rotary kiln for the direct reduction of materials containing iron oxides using a solid carbonaceous reducing agent as the reductant and fuel and having a preheat zone toward the charge feed end, a reduction zone toward the discharge end and of the type comprising:

means for adding part of the solid carbonaceous reducing agent through the discharge end of the kiln concurrently with the flow of the combustion gases within the kiln;

means for adding the remainder of the solid carbonaceous reducing agent through the feed end of the kiln out of which end the combustion gases exhaust; and

means spaced along the length of the kiln for injecting air under pressure axially therein; the improvement wherein said air injecting means comprises:

means at the feed end of the kiln for injecting air toward said feed end concurrently with the flow of the combustion gases; and

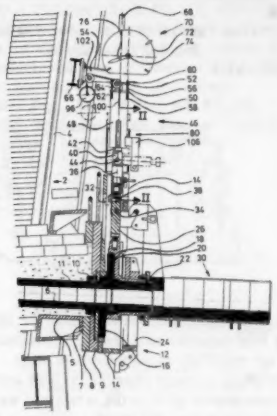
means along the remainder of the kiln for injecting air toward the discharge end of the kiln against the combustion gases flowing toward the feed end.

4,273,315
SLIDE CLOSURE FOR THE TAPPING CHANNEL OF A MOLTEN METAL CONTAINER

Bernhard Tinnes, Zollikerberg, Switzerland, assignor to Metacon AG, Zurich, Switzerland

Filed May 1, 1980, Ser. No. 145,875
Claims priority, application Fed. Rep. of Germany, May 7, 1979, 2918344
Int. Cl.³ C21C 5/48
U.S. Cl. 266—236 **11 Claims**

1. A slide closure for the tapping channel of a molten metal container provided with a framework, such closure comprising a slide housing, a refractory bottom to said housing, a movable slide guided by said slide housing, a refractory slide plate to said movable slide, a lifting drive detachably connected to said slide, a coupling interconnecting said lifting drive and slide, a housing for said lifting drive, a flexible supporting member connectable to said container framework for supporting said lifting drive, and a detachable connecting member between said drive housing and said slide housing, said connecting member being arranged to act on said slide housing in a plane

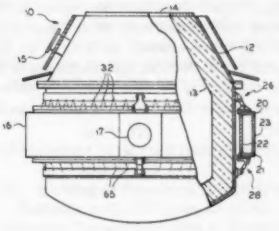


containing the axis of said lifting member and symmetrically with respect to the said axis.

4,273,316
METALLURGICAL VESSEL SUSPENSION SYSTEM

Rashed N. Nagati, Mars, Pa., assignor to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

Filed Jul. 27, 1979, Ser. No. 60,993
Int. Cl.³ C21C 5/50
U.S. Cl. 266—246 **12 Claims**



1. A metallurgical vessel subject to expansion and contraction during its operating cycles, said vessel including:

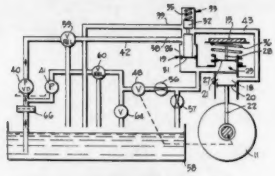
support means at least partially surrounding said vessel,

a plurality of members disposed in spaced apart relation around said vessel and each including first and second ends, first means for pivotally connecting the first end of each member to said vessel and second means for pivotally connecting the second end of each said member to said support, the portion of each member between said ends being free of connection to said vessel, one of said first and second means including a ball joint whereby misalignment may occur between the pivotal connections at the opposite ends of said members as said vessel expands and contracts.

4,273,317
SERVO CONTROLLED VEHICLE SUSPENSION

Leonard J. Blee, 66 Leslie Ave.,, Blair Athol, South Australia, Australia

Filed Oct. 11, 1978, Ser. No. 950,362
Int. Cl.[3] B60G 21/06
U.S. Cl. 267—64 A 17 Claims



1. Hydraulic suspension means suitable for interpositioning between a first structure and a second structure which said structures are relatively movable, comprising:

walls defining a pressure chamber, at least one of said walls being movable relative to the other said walls so that the pressure chamber is of variable volume, and means interconnecting one of said relatively movable walls to one of said structures,

a resilient sensing device interpositioned between a second of said relatively movable walls and the second said structure and arranged to sense movement therebetween responsive to variations in compressive force,

a pump,

a valve having a movable valve member and a drain port, a first conduit extending between the pump and the valve, a second conduit extending between the valve and the chamber, and valve control means coupling the sensing device and the movable valve member and operable to move the valve member to a first position where it opens a pressure liquid flow path between the pump and chamber as said structures move apart so that the pump directs liquid flow into the chamber to thereby expand the chamber volume and assist said movement apart,

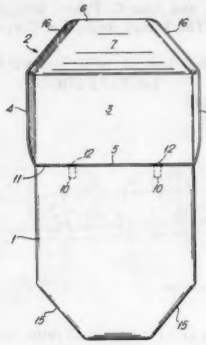
said valve control means also being operable to move the valve member to a second position where it closes said pressure liquid flow path and opens a drain flow path between said second conduit and said drain port as said structures move towards each other so that some of the contents of the chamber are discharged to drain to thereby allow movement of said structures toward each other without proportional increase in resistance to that movement.

4,273,318
FOOD PREPARATION APPLIANCES

Brian H. Crowhurst, 2/19 Liam Pl., Howick, Auckland, New Zealand

Filed Mar. 26, 1980, Ser. No. 134,273
Claims priority, application New Zealand, Mar. 4, 1979, 190098
Int. Cl.[3] B23Q 3/00
U.S. Cl. 269—13 8 Claims

1. A food preparation appliance comprising a tray, a chopping board and means for detachably connecting said tray to said chopping board, said tray having an end wall of a height no greater than the thickness of said chopping board, a base, side walls and an opening opposite said end wall, said detachable connecting means permitting association to be maintained between said chopping board and said tray while further permitting limited displacement between said chopping board and

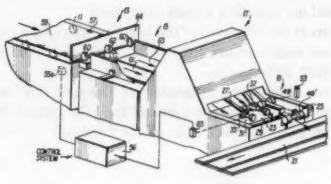


said tray in directions substantially parallel to the plane of said end wall.

4,273,319
DOCUMENT SEQUENCER

Lester H. Stocker, Phillipsburg, N.J., assignor to Bell & Howell Company, Phillipsburg, N.J.

Filed May 30, 1978, Ser. No. 910,326
Int. Cl.[3] B41F 13/56
U.S. Cl. 270—21.1 12 Claims



1. An automated in-line mailing system including:

a web supply means for supplying a sheet-web having indicia thereon;

a cutter means attached to said web-supply means for receiving said sheet web and cutting said sheet web into side-by-side individual sheets;

a folding means for receiving said individual sheets along adjacent channels from said cutter means and for folding said sheets;

a collector sequencer means for receiving said folded sheets along adjacent channels from said folder means and accumulating said folded sheets respectively received from said adjacent channels in adjacent collector bins, at least one of said collector bins including an ejecting means for ejecting its contents into the other collector bin and the other collector bin including an ejecting means for ejecting its contents to further processing equipment; and

a control system including a scanner means for sensing said sheet web indicia upstream of said cutting element, said control system being coupled to at least one collector bin to eject its contents into the other collector bin in response to indicia read from said sheet web by said scanner.

7. An automated in-line mailing system including:

a web supply means for supplying a sheet-web having indicia thereon;

a cutter means attached to said web-supply means for receiving said sheet web and cutting said sheet web into side-by-side individual sheets;

a collector sequencer means for receiving said individual

sheets from said cutter means along parallel channels, accumulating said individual sheets respectively received from said adjacent channels in adjacent collector bins, at least one of said adjacent collector bins including an ejecting means for ejecting its contents into the other collector bin, and the other collector bin including an ejecting means for ejecting its contents to further processing equipment; and

a control system including a scanner means for scanning said sheet-web indicia upstream of said cutting element, said control system being coupled to said at least one collector bin for ordering said at least one collector bin to eject its contents into the other collector bin in response to indicia read from said sheet web by said scanner.

4,273,320

FOLDING MECHANISM FOR A PRINTING PRESS

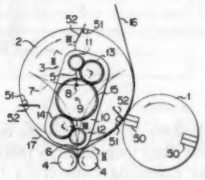
Yuji Fujishiro, Tokyo, Japan, assignor to Kabushiki Kaisha Tokyo Kikai Seisakusho, Tokyo, Japan

Filed Jun. 19, 1978, Ser. No. 916,749

Claims priority, application Japan, Feb. 27, 1978, 53-23434[U]

Int. Cl.³ B65H *45/16*

U.S. Cl. 493—427 **3 Claims**



1. In a folding mechanism for a printing press including a frame of the printing press, a folding cylinder rotatably mounted on said frame, an eccentric member fixedly secured to said frame, said eccentric member having first and second holes formed therein, a sun gear shaft inserted in the first hole of said eccentric member and fixedly secured thereto, said sun gear shaft having a sun gear formed at one end thereof, a gear box rotatably mounted on said sun gear shaft, and a drive shaft rotatably mounted on said frame at one end thereof, the other end of said drive shaft being fixedly secured to said gear box and adapted to rotate together; the improvement comprising a pair of idler gears rotatably mounted in said gear box adapted in mesh with said sun gear, a pair of folding blade shafts rotatably mounted on said gear box, each of said folding blade shafts having a plurality of folding blades and a driving gear mounted thereon, said driving gears being adapted to mesh with said idler gears and one of said driving gears being adapted to move in axial direction out of engagement of said idler gear, manually-operated means for interrupting the drive to one of said folding blade shafts for silencing the folding blades associated therewith comprising a manipulating ring rotatably mounted on said gear box, one end of said one of the folding blade shafts being inserted into said manipulating ring and having an axial hole formed therein, a manipulating disc fixedly secured to said manipulating ring, said manipulating disc having a hole formed therein, an engaging member disposed in the hole of said manipulating disc for selectively engaging or disengaging said one of the folding blade shafts with or from said manipulating disc, and spring means disposed in the axial hole of said one of the folding blade shafts for urging said engaging member toward said manipulating disc so as to engage said folding blade shaft with said manipulating disc, and interlock means fixedly mounted on said gear box for locking said one of folding blade shafts against rotation when said one of driving gears is moved in axial direction out of engagement of one of said idler gears to engage with said interlock means.

4,273,321

APPARATUS FOR FEEDING CONDUCTOR PLATES INTO A CONDUCTOR PLATE TESTER

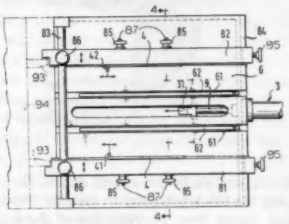
Erich Luther, Ronnenberg, and Martin Maelzer, Wunstorf, both of Fed. Rep. of Germany, assignors to Luther & Maelzer GmbH, Wunstorf, Fed. Rep. of Germany and Limited-Liability Company, both of, Fed. Rep. of Germany

Filed Dec. 18, 1978, Ser. No. 970,484

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1978, 2814954

Int. Cl.³ B65H *3/24, 3/46*

U.S. Cl. 271—10 **4 Claims**



1. Apparatus for feeding conductor plates from a stack thereof to a conductor plate tester, including in combination:

a base plate supporting a stack of thin conductor plates,

stack forming means for retaining said stack,

reciprocating feeding means for removing the lowermost plate only of said stack from said stack and propelling it forwardly,

a transport path disposed in the same plane as said base plate, for receiving each forwardly projected plate and leading it to said tester,

said transport path being inclined downwardly toward said tester, so that said conductor plates are moved therealong by the force of gravity,

said feeding means being inclined at the same angle as said transport path and said stack-forming means being perpendicular thereto, and

control means for preventing the last, uppermost, conductor plate of the stack from sliding down the transport path uncontrolled after the remaining plates of the stack have been removed, said control means including said base plate having at least one recess and a spring located in said recess which, when in untensioned condition, projects above the upper surface of the base plate.

4,273,322

GATE MECHANISM FOR CARTON ERECTING MACHINE

George E. Ginther, Sr., King of Prussia; A. David Johnson, Jr., and Joseph L. Bachman, both of Wayne, all of Pa., assignors to Wayne Automation Corporation, King of Prussia, Pa.

Filed Jul. 9, 1979, Ser. No. 55,764

Int. Cl.³ B31B *1/06*

U.S. Cl. 271—149 **5 Claims**

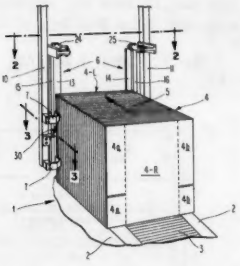
5. In a carton erecting machine having frame means mounting a magazine supporting a stack of vertically oriented, flat folded cartons arranged one beside the other along an axis, the magazine including means to move and guide the cartons one after another to a take-down station, improved gate mechanism to releasably retain a carton in the take-down plane comprising;

first and second carton restrainer means, each mounted to be moved as between open and closed positions;

means to move said first and second restrainer means so that when the first restrainer means is in the closed position the second restrainer means is in the open position and when the first restrainer means is in the open position the second restrainer means is in the closed position;

in the respective open positions each restrainer means being disengaged and spaced from the cartons of the stack;

in the closed position of the first restrainer means, the first restrainer means engaging the lead carton of the stack whereby to restrain motion of same and to locate the lead carton in a take-down plane at said take-down station; and



in the closed position of the second means, the second means engaging the stack whereby to restrain the carton next to the lead carton from popping out of the stack when the lead carton is taken down for the erection operation.

4,273,323

SHEET FEEDING APPARATUS FOR COPYING MACHINE, PRINTING MACHINE, ETC.

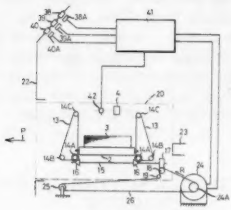
Tamaki Kaneko, Fujisawa; Kenich Mizuma, Yokohama, and Tugio Okuzawa, Tokyo, all of Japan, assignors to Ricoh Co., Ltd., Japan

Filed Nov. 13, 1978, Ser. No. 959,597

Claims priority, application Japan, Nov. 24, 1977, 52-139827; Nov. 24, 1977, 52-139828; Dec. 7, 1977, 52-146134; Dec. 8, 1977, 52-146627; Dec. 12, 1977, 52-148108; Dec. 12, 1977, 52-148109; Dec. 14, 1977, 52-149343

Int. Cl.³ B65H *1/14, 1/26*

U.S. Cl. 271—157 **6 Claims**



3. In a photocopying machine including a housing having means for feeding sheets into association with an image bearing member for the purpose of transferring the image to the sheets, the improvement comprising a frame movable into and out of said housing, a tray for the sheets on said frame, first conveyor means on said frame connected to said tray for moving said tray toward and away from the feeding means for positioning the sheets on said tray into association with said feeding means for the feeding thereof, second conveyor means in the housing connected to said frame for moving said frame out of said housing for the loading and unloading of sheets onto said tray and into said housing, and actuation means connected between said first and second conveyor means and between said tray and frame and said housing to cause said first conveyor means to move said tray when said frame is inside said housing into association with said feeding means so that the sheets may be fed thereby and to move said tray away from said feeding means to a lowermost position thereof in said housing, said housing including a stop therein, said frame being movable into said housing until it is stopped by said stop, said actuation means moving said frame into and out of said housing when said tray is in the lowermost position and being effective, when said frame is stopped by said stop, to actuate said first conveyor to move said tray toward said feeding means.

4,273,324

SUCTION BRAKING APPARATUS

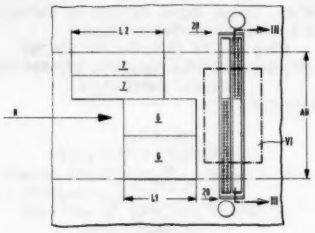
Helmut Philipp, Eckrath-Unterbach, Fed. Rep. of Germany, assignor to Jagenberg Werke Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Aug. 1, 1979, Ser. No. 63,026

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1978, 2833570

Int. Cl.³ B65H *29/68*

U.S. Cl. 271—183 **4 Claims**



1. A suction braking apparatus for the braking and overlapping of sheets travelling longitudinally thereover, comprising a suction chamber extending transversely of the direction of travel of the sheets and provided with first and second groups of suction holes, each group extending across a portion of the transverse length of the suction chamber, aligned first and second cover plates respectively provided with perforations in register with the first and second groups of suction holes, first and second cover slides respectively provided for cooperation with the first and second groups of suction holes, the first cover slide ending at a junction line across the suction chamber and transverse of the direction of travel of the sheets where the second cover slide begins, and perforated control belts operatively connected with said first and second cover slides so as to be able to displace them across the suction chamber and thereby locate said junction line at any predetermined point across the suction chamber, whereby the cover slides can be moved to accommodate changes in the width of sheets to be operated upon by each of the first and second groups of suction holes.

4,273,325

SHINGLED SHEET ALIGNMENT

Dennis W. Rodewald, Phillips, Wis., assignor to Marquip, Inc., Phillips, Wis.

Filed Mar. 8, 1979, Ser. No. 18,603

Int. Cl.³ B65H *31/26*

U.S. Cl. 271—220 **4 Claims**

1. In a sheet handling device:

(a) a conveyor for conveying a plurality of sheets in succession,

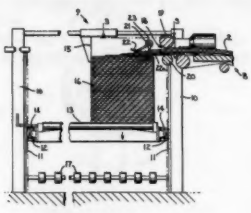
(b) a nip disposed at the discharge end of the conveyor for passing sheets therethrough,

(c) a sheet stacker disposed downstream of said nip for receiving and stacking said sheets,

(d) and stop means disposed between said nip and said stacker for guiding the longitudinal sheet edges in a manner to prevent transverse shifting of said edges as the sheets pass from said nip to said stacker, said stop means comprising:

(1) an elongated mounting element disposed above the path of the traveling sheets and extending transversely thereof and outwardly beyond the said longitudinal sheet edges,

(2) and a plurality of fingers normally hanging downwardly by gravity and arrayed along said mounting element,



(3) a first portion of said fingers being disposed in the path of said sheets and engageable thereby so that said first portion of fingers are swung forwardly and upwardly about a transverse axis and rest on the sheets,

(4) and a second portion of said fingers remaining out of the path of the traveling sheets and hanging downwardly to guide the said longitudinal sheet edges.

4,273,326

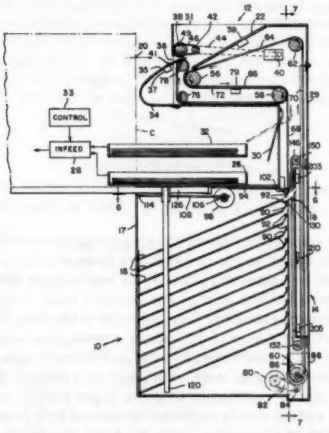
COLLATOR

Donald L. Snellman, and Osceola J. Gerbracht, both of Seattle, Wash., assignors to Norfin, Inc., Seattle, Wash.

Filed Dec. 14, 1978, Ser. No. 969,383

Int. Cl.³ B65H *39/11, 29/58, 31/24*

U.S. Cl. 271—288 **19 Claims**



1. A collator, comprising: sheet receiver means for receiving a sheet adjacent one side thereof; sheet infeed means including a sheet support surface and means for positioning an incoming sheet thereon operatively associated with said sheet receiver means for accepting an incoming sheet adjacent the side of said receiver means opposite the one side thereof; sheet conveyor means for engaging the sheet positioned on said support surface to remove said sheet therefrom by movement in said opposite direction; and then moving the sheet in a direction corresponding to its direction of movement when accepted by said sheet infeed means while maintaining an inverted surface orientation, and sheet deflector means operatively associated with said conveyor means for deflecting a sheet moving along said course of travel adjacent the one side of said receiver means for reception by said receiver means with said sheet having resumed its corresponding surface orientation, wherein said sheet conveyor means include a sheet conveyor assembly which comprises opposed moveable conveyor tape means for engaging opposed surfaces of a sheet positioned on said sheet support surface to move said sheet in said opposite direction while curving said sheet until inverted and underlying said sheet support surface for movement in said corresponding direction toward the one side of said receiver means, and wherein one of said conveyor tape means include a portion continuing along the one side of said receiver means in a direction substantially perpendicular to said corresponding direction toward said deflector means, and wherein said receiver means include a column of spaced bins having inlets which face the one side of said receiver means; said sheet deflector means include a moveable sheet deflector assembly operatively associated with said continuing conveyor tape means portion, means mounting said deflector assembly for movement along said course of travel, and means for positioning said deflector assembly along said course for deflecting sheets therefrom into selected ones of said bins; and said sheet conveyor assembly includes sheet retaining means for holding a sheet on said continuing conveyor tape means portion for movement to the position at which it is deflected.

13. A collator for use with a copier to duplex copy, the collator comprising: sheet receiver means for receiving a sheet adjacent one side thereof; a sheet support surface, means for positioning an incoming sheet from a copier adjacent the side of said receiver means opposite the one side thereof; sheet conveyor means operatively associated with said receiver means and said sheet support surface for engaging the sheet positioned on said support surface to remove said sheet therefrom by movement in said opposite direction while maintaining its surface orientation and then moving said sheet in a direction corresponding to its direction of movement when accepted by said sheet support surface while maintaining an inverted surface orientation; and sheet deflector means operatively associated with said conveyor means for returning the sheet copied on one surface from said receiver means to the copier adjacent the opposite side of the receiver by deflecting the sheet moving along said course of travel adjacent the one side of said receiver means for reception by said receiver means with said sheet having resumed its corresponding surface orientation to effect a copy on the opposite surface thereof.

4,273,327

SKI EXERCISING APPARATUS

Clive Nall, Los Gatos; Leo E. Long, Los Altos; Sterling C. Rigby, Los Altos, and K. Boyd Baugh, Los Altos, all of Calif., assignors to Major Sports Sales, Inc., Mountain View, Calif.

Filed Dec. 10, 1979, Ser. No. 102,120

Int. Cl.³ A63B *69/18*

U.S. Cl. 272—97 **7 Claims**

1. A ski exercise apparatus comprising:

a tilt swivel board with a top planar surface and a bottom surface of substantially convex shape;

a plurality of elastic and extensible spring members connected on the one hand to said tilt swivel board and on the other hand to means for grasping by a user while standing upon said tilt swivel board and extending said elastic and extensible spring members so as to tilt said tilt swivel board in reaction to weight changes in said user's legs; and

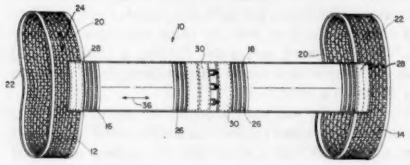
a belt means for attachment snugly generally about the waist of the user with said elastic and extensible spring members passing through said belt means.

4,273,328

CHEST MUSCLE AND POSTURE DEVELOPER

Suzan N. Ozbey; Amber L. Ozbey, and Ahmet M. Ozbey, all of 205 Bonhill Dr., Ft. Washington, Md. 20022

Filed Jun. 8, 1979, Ser. No. 46,817
Int. Cl.³ A63B *21/02*
U.S. Cl. 272—137 **12 Claims**



1. An apparatus for use in developing the chest muscles and posture of a user without substantially developing the arm muscles of the user comprising at least two arm encircling means, a first of said arm encircling means being adapted to encircle the upper left arm and a second of the arm encircling means being adapted to encircle the upper right arm of the user, a back traversing means connected between said first and second arm encircling means, said back traversing means being elastically extensible to vary the distance between said first and second arm encircling means and including a first section formed of elastic material, a first inelastic connector extending between said first section and said first arm encircling means, said first inelastic connector being secured to said first section and to said first arm encircling means, and a second inelastic connector extending between said first section and said second arm encircling means, said second inelastic connector being secured to said first section and to said second arm encircling means.

4,273,329

FLAG PIN ATTACHMENT INCLUDING BALL DISTANCE MEASURING LINE AND TURF REPAIR TOOL

Donald L. Trigg, 10934 Gazette Ave., Chatsworth, Calif. 91311, and Richard V. Portolan, 557 Daroca Ave., San Gabriel, Calif. 91775

Filed Mar. 13, 1980, Ser. No. 129,917
Int. Cl.³ A63B *57/00*
U.S. Cl. 273—32 B **2 Claims**

1. An apparatus for use in playing golf, comprising:

a housing;

a spool rotatably attached to said housing, said spool containing a length of line wound on said spool, said line having a first end and a second end, and attached to said spool at said first end;

a coiled spring attached to said spool and said housing, said spring being caused to distort from a relaxed position in response to said line being unwound by rotation of said spool, and said spring returning to said relaxed position, causing said spool to rotate to rewind said line, when the tension on said line is released;

an attaching member including a clip affixed to said housing and adapted to engage a golf hole flag stick as said line is unwound from said spool, said clip including a shaft attached to said housing, a first clip member having a prong portion and an arcuate portion, formed integrally with said prong portion, and having an end, and a second clip member having a prong portion and an arcuate portion, formed integrally with said prong portion, and having an end, and,

said first and second clip members being pivotally attached to said shaft;

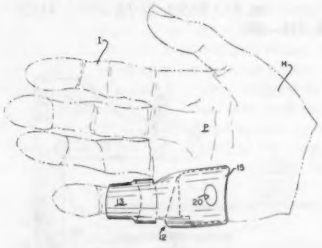
a spring attached to said first and second clip members, said spring urging said ends of said arcuate sections into contact.

4,273,330

BOWLER'S FINGER SUPPORT

Paul Buneta, 7101 S. Grand Ave., St. Louis, Mo. 63111

Filed Mar. 27, 1979, Ser. No. 24,303
Int. Cl.³ A63B *69/00*
U.S. Cl. 273—54 B **8 Claims**



1. A finger support for application by a bowler in association with the little finger on the ball delivery hand and for use in urging the ball in a direction towards the index finger and the proximate portion of the palm of the bowler's hand, comprising, a base member extending longitudinally of the little finger of the hand when in use and for disposition contiguous with the inner surface of the said finger and the approximate region of the upper palm associated with such finger and aligned therewith, a band means connecting with the upper portion of the base member and for snugly surrounding the said little finger to insure retention of the support upon the hand, the lower portion of the base member widened and thickened for disposition intermediate the said aligned palm region and the bowling ball to effect ball displacement from the hand at this location and causing a shift of the weight towards the index finger of the ball supporting hand, said base member, band means, and lower portion all being cut and formed from a tubular type flexible material, said material being designed cut at its upper portion to form the said base member and integral band means of the support, a spacer means provided within the lower portion of the base member to provide means for maintaining the thickened and widened disposition of the support at said location, said spacer means comprising a plate that is tapered and forms an upper angular surface within the widened lower

portion of the base member and useful for urging the ball further towards the center of the bowler's palm, whereby the ball is urged in the direction towards the index finger and the proximate portion of the palm of the bowler's hand.

4,273,331

TENNIS-RACKET

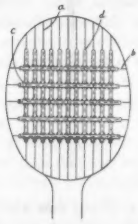
Werner Fischer, Lichtenburgerstrasse 13, 8313 Vilsbiburg, Fed. Rep. of Germany

Filed Dec. 8, 1977, Ser. No. 858,644

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1976, 2656082

Int. Cl.³ A63B *51/02*

U.S. Cl. 273—73 D **6 Claims**



1. A grid for use in conjunction with the strings of a game racket, comprising:

a plurality of first guide members disposed in a first direction to be disposed on a plurality of first strings of a game racket for receiving and guiding the movement of said first strings, and

means for connecting said first guide members to form a unitary grid having a plurality of open areas so that when said grid is disposed on said first strings of a game racket, said grid moves substantially as a unit, and so that said grid and said first strings of the game racket move as a unit and slide relative to second strings transversely-disposed to said first strings of the game racket when struck by a ball to increase the amount of spin imparted to said ball.

4,273,332

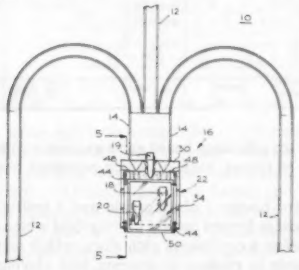
TOY RACING APPARATUS

Gordon H. Buck, Torrance, and Kenneth I. Amamoto, Los Angeles, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Aug. 23, 1979, Ser. No. 69,035

Int. Cl.³ A63F *9/14*; A63H *17/42*

U.S. Cl. 273—86 R **2 Claims**



1. A toy for determining the final position of toy racing vehicles comprising a base over which toy vehicles may be operated, a cover supported over the base, and means for collapsing the cover onto vehicles traversing the base including a set of linkages rotatably positioning the cover over the base, a spring for placing a downward force on the cover, and trigger means for causing the base to begin rotation in response to a vehicle reaching a particular location on the base, whereby such vehicles come to rest in positions indicative of their positions in a race.

4,273,333

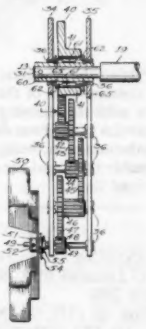
GEAR TRAIN GOVERNORS IN SPINNING REEL GAMES

Frank G. Nicolaus, Chicago, Ill., assignor to Bally Manufacturing Corporation, Chicago, Ill.

Filed Feb. 28, 1979, Ser. No. 16,099

Int. Cl.³ A63F *5/04*; F16D *41/06*

U.S. Cl. 273—143 R **2 Claims**



1. In cyclically operable game apparatus of the type wherein a drive shaft is oscillated in each game cycle in a forward setting phase initially with reversal in a return stroke phase in which the speed thereof is regulated by governor means of the fan-loaded gear-train type, improvements in governor means characterized in that: the governor comprises a gear array including a large diameter input gear coupling with said drive shaft, and a small low-torque output gear driving a loading fan, together with a train of intermediate reduction gears drivingly interconnecting the input and output gears, said input gear being drivingly coupled with said drive shaft through a unidirectional clutch of the precision ball type operative to drive the input gear only in the direction of rotation of the drive shaft in the return phase thereof, such that the respective gears in the entire array are constrained always to turn in the same unidirectional progression through cumulatively complete revolutions, and no gear can be repetitiously oscillated in any game cycle operation of said drive shaft, whereby all of the teeth of all of the gears in the array will be exposed to wear stress notwithstanding repetitious oscillation of the drive shaft in repetitious cycling of said game apparatus.

4,273,334

REEL MECHANISM FOR USE IN A PLAYING DEVICE

Siegfried Schöne, and Joachim Ramlow, both of Berlin, Fed. Rep. of Germany, assignors to Gunter Wulff-Apparatebau GmbH, Berlin, Fed. Rep. of Germany

Filed May 29, 1979, Ser. No. 43,371

Int. Cl.³ A63F *5/04*

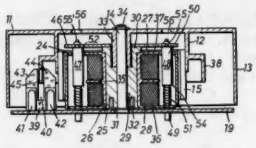
U.S. Cl. 273—143 R **24 Claims**

1. A reel mechanism for use in a playing device, comprising:

a rotatable body having a plurality of substantially equally spaced symbols to be sequentially displayed in a visual field, said rotatable body comprising a DC motor having a rotor and a stator, said rotor being rotatably disposed about the stator and the rotatable body forming an outer apron disposed about the rotor with said symbols on said outer apron;

scanning means operatively associated with the rotatable body for generating scanning signals, each of said scan-

ning signals uniquely corresponding to a respective symbol position, which signals are indicative of the rotational position of the rotatable body relative to the visual field; switching means operatively connected to the scanning means for receiving said scanning signals therefrom, the switching means providing pulsing signals to the DC



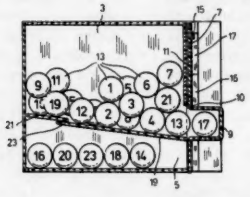
motor for energizing the magnetic field within the stator to control the commutation of the DC motor in pulsing synchronization, with the scanning signals thereby effecting rotational motion of the rotatable body, and said scanning signals, at the same time being indicative of the position of the rotatable body and the respective symbol displayed in the visual field.

4,273,335

INDICIA SELECTOR

Georges Allonsius, 17 Lascelles Blvd., Suite 208, Toronto, Ontario, Canada (M4V 2B6)

Filed Nov. 13, 1979, Ser. No. 93,054
Int. Cl.³ A63F *7/04*
U.S. Cl. 273—144 B **9 Claims**



1. A portable handheld indicia selector for selecting indicia at random and being particularly suitable for lottery selections, said selector comprising a totally enclosed unit consisting of an opaque mixing chamber for mixing a plurality of indicia bearing members, each of which bears its own distinct indicia, a transparent deposit chamber to which said indicia bearing members are deposited directly from said mixing chamber, wall means separating said deposit chamber from said mixing chamber and means for moving the indicia bearing members past said wall means from one chamber to the other, such that the members deposited in the deposit chamber are maintained therein in the order in which they are moved, the arrangement being such that the indicia bearing members in the mixing chamber are hidden from view and mixable with one another for random movement to the deposit chamber where they are clearly apparent.

4,273,336

GOLF SWING AID

Orval W. Larkey, Thousand Oaks, Calif., assignor to J. T. Posey Company, Arcadia, Calif.

Filed May 8, 1980, Ser. No. 148,162
Int. Cl.³ A63B *69/36*
U.S. Cl. 273—189 R **5 Claims**

1. A golf swing aid comprising an elongated first strap; fastening means for releasably securing opposite end portions of the first strap to form a first loop that makes a snug fit around the first wrist of a golfer; an elastically stretchable second strap overlying the first strap and fixed at opposite end portions to the first strap, the second strap cooperating with the first strap to form a second loop between them; the elastically stretchable second strap being stretchable away from the

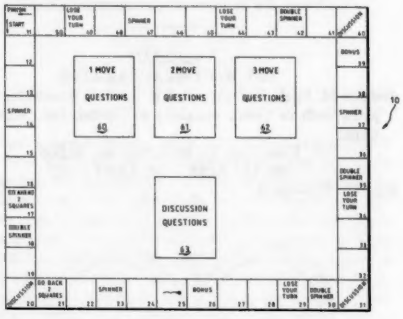
first strap to enlarge the enclosed area within the second loop to a size comparable to the enclosed area within the first loop in order to accommodate the second wrist while both hands are gripping a golf club, the second strap being under tension when forming said enlarged second loop.

4,273,337

FAMILY SEX EDUCATION BOARD GAME

Michael A. Carrera; June F. Carrera, both of 444 E. 82nd St., New York, N.Y. 10028; Melvyn S. Littner, and Lorna C. Littner, both of 52 W. 57th St., New York, N.Y. 10019

Filed Oct. 11, 1979, Ser. No. 83,877
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—243 **8 Claims**



1. A family sex education board game apparatus comprising:

a plurality of tokens, each of which represent one of the players;

a game board having a playing field and a multiplicity of playing spaces formed on said playing field which cooperatively define a continuous path along which said tokens are movable in random increments, said playing spaces including a starting and finishing space and at least four different sets of spaces, a first set of spaces interspersed along said path having instructions thereon concerning the loss of a turn, a second, third and fourth set of spaces interspersed along said path, each of which has identical indicia thereon which is different from the indicia of the other sets;

three decks of cards, each card in each of said decks having a question thereon concerning the field of human sexuality, the cards in the same deck having questions of relatively the same difficulty and the cards in the different decks have questions of various levels of difficulty, each deck divided into a plurality of subdecks having questions thereon directed to a particular category of human sexuality, the categories being the same between said three decks, each of the cards of each one of the categories identified by indicia common to that category and distinct from the indicia on the cards of the other categories;

a fourth deck of cards associated with said fourth set of playing spaces, each of which contain a question for discussion among the players in the field of human sexuality;

a spinner device associated with said second and third sets for playing spaces which includes a base plate having a plurality of radially-arranged spaces thereon, each of which bear a number concerning movement of the player's token which lands on one of said spaces of said second and third sets, and a spinner rotatably mounted on said base plate for randomly selecting one of said spaces on said base plate;

an answer booklet containing the answers to the questions set forth in said four decks of cards; and

a category score sheet for scoring one's correct answers according to various categories of human sexuality

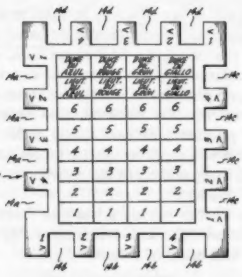
the score sheet categories having indicia thereon corresponding to the indicia on the cards within the said subdeck categories.

4,273,338

GAME APPARATUS WITH NOTCHED GAME BOARD

Michael Yaeger, P.O. Box 4304, Pioneer Square Station, Seattle, Wash. 98104

Filed Apr. 25, 1979, Ser. No. 33,135
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—282 **9 Claims**



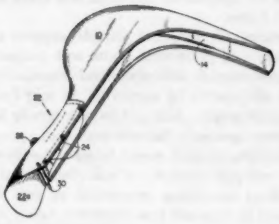
1. A game apparatus comprising in combination a playing board and a set of blocks, the blocks being divided into first, second, third and fourth groups, each group containing an equal number of blocks, each block having upon it some marking that indicates to which group it belongs and also having upon it some indicia of its priority within its group, the board being a closed polygon, each side of the board having notches integrally formed therein along the perimeter of the polygon, said notches adapted to receive said blocks as they are played, the board further having a central portion divided into a plurality of spaces equal to the number of blocks in the set, each space carrying thereon indicia corresponding to a particular block and adapted to receive said corresponding block as play of the game progresses.

4,273,339

PLASTIC CESTA

Gilbert J. Fortunato, 23 Blinn St., East Hartford, Conn. 06108

Filed Apr. 26, 1979, Ser. No. 33,420
Int. Cl.³ A63B *65/12*
U.S. Cl. 273—326 **4 Claims**



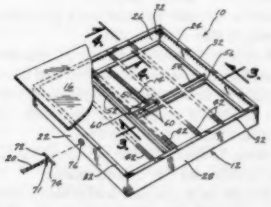
1. A molded plastic cesta for throwing or catching an object such as a ball, said cesta comprising a body portion defining a chute having a generally straight launching surface segment adjacent one end and an arcuate inner ramp surface connected to said straight surface and tangent therewith, said arcuate inner surface having a radius of curvature which decreases in magnitude along the inwardly curved surface, and an inner end of said body portion defining a generally straight segment connected to the inner end of said decreasing radius portion of sharpest curvature by a reversedly curved portion such that the said straight inner and outer segments are generally perpendicular to one another, said body portion having generally parallel crescent shaped sides integrally connected to said ramp surface to define a U-shaped chute having a pocket in the area of sharpest curvature, and a glove defining flexible member attached to the surface of said flat inner segment opposite the ramp surface thereof, said body portion having a uniform thickness, being formed from a single plastic member and having outturned flanged portions integrally formed in said sides, which flanged portions have the same thickness as said sides, and stiffeners for said flanged portions, said stiffeners being made from U-shaped plastic strips slidably received on said outturned flanged portions, a cestus for securing the cesta to the wrist, metal bracket means secured to the innermost end portion of the plastic cesta ramp surface and defining an elongated opening transverse to the chute, and a peg for said opening, said peg having end portions projecting beyond the sides of said bracket to facilitate girdling the cestus onto the wearer's wrist.

4,273,340

HORSESHOE STAKE SUPPORT APPARATUS

James L. Hackett, 522 N. Sierra Dr., Council Bluffs, Iowa 51501

Filed Jan. 29, 1979, Ser. No. 7,475
Int. Cl.³ A63B *67/06*
U.S. Cl. 273—336 **14 Claims**



1. A portable horseshoe court comprising,

a generally peripheral support frame,

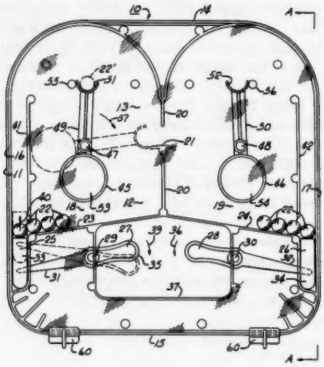
an elongated horseshoe stake,
a horseshoe stake support block,
said block having a hole which opens through the top thereof for receiving said horseshoe stake,
said stake being received in press-fit relation in said hole whereby said stake is rigidly secured relative to said block,
means for operatively securing said stake support block to said frame,
a plurality of elongated flexible support means extended across said peripheral frame and connected at opposite ends thereof to said peripheral frame,
a pad adapted to be supported on said frame and flexible support means, said pad having a hole for said stake to extend upwardly therethrough, and
said flexible support means being the only vertical support for said pad interiorly of said pheripheral frame whereby resilient stretching movement of said flexible support means in response to a horseshoe being pitched onto said pad permits said pad to resiliently yield in a vertical direction, thereby to at least partially absorb the impact of said horseshoe.

4,273,341

GAME APPARATUS INCLUDING PROJECTILE AND PIVOTAL TARGETS

John T. Warrix, Columbus, Ohio, assignor to Wolverine Toy Company, Booneville, Ark.

Filed Feb. 14, 1980, Ser. No. 121,375
Int. Cl.³ A63F *9/02, 7/02*
U.S. Cl. 273—357 **4 Claims**



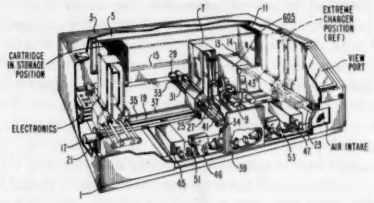
4. An amusement game device comprising:
an up-standing housing including spaced front and back vertical walls joined by top, bottom and side walls;
said front wall formed at least in part of transparent material;
said housing internally separated into left and right compartments by a vertical wall;
a window in said vertical wall providing communication between said compartments;
a plurality of projectiles in one of said compartments;
a pendulum pivotally mounted in said one compartment and having an upwardly extending arm which extends above the pendulum pivot and a projectile target at the top of said upwardly extending arm;
a launcher in said one compartment for launching a projectile within said one compartment;
said pendulum positioned within said one compartment such that when a projectile is launched and thereby projected into said target, said pendulum will pivot from the weight of said projectile resting in said target to dump the projectile into the other compartment through said window.

4,273,342

PROTECTIVE CARTRIDGE FOR OPTICAL DISCS

Alan P. Gilson, Collingswood, and Bohdan W. Siryj, Cinnaminson, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 23, 1979, Ser. No. 41,677
Int. Cl.³ G11B *17/00, 5/48*
U.S. Cl. 369—32 **2 Claims**



1. A cartridge for use in an information storage and retrieval system for optically reading information stored on an optical disc, said system having a storage module including a plurality of storage locations for storing optical discs enclosed in cartridges, each of said storage locations including at least one storage positioning element, having a reader wherein said optical disc is placed during information retrieval, said reader having a means for providing a beam of coherent light, said reader including at least one reader positioning element, and having a disc changer for transporting a cartridge enclosing said optical disc between said storage module and said reader, said disc changer having an electromagnetic means embedded in said changer; said cartridge comprising:
a frame having first and second ends and at least one other edge;
said first end having an aperture for coupling said cartridge to said at least one storage positioning element of one of said plurality of storage locations;
said second end having an aperture for coupling said cartridge to said at least one reader positioning element of said reader; and
a magnetically actuated spring coupled to said other edge of said frame, said magnetically actuated spring having a relaxed position and a latched position, said spring being in said relaxed position when said cartridge is located in one of said plurality of storage locations or in said reader during information retrieval, said spring being in said latched position with said spring deflected into engagement with said electromagnetic means when said changer is transporting said cartridge between said storage module and said reader;
said frame further having a window therein for providing access to an information bearing surface of said optical disc by said beam of coherent light.

4,273,343

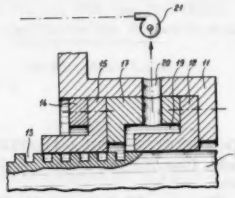
SHAFT SEAL

Teunis Visser, Sliedrecht, Netherlands, assignor to IHC Holland N.V., Rotterdam, Netherlands

Filed Nov. 8, 1979, Ser. No. 92,556
Claims priority, application Netherlands, Nov. 10, 1978, 7811164
Int. Cl.³ F16J *15/40, 15/44*
U.S. Cl. 277—53 **7 Claims**

1. Seal of a shaft, said shaft being rotatable relative to a stationary housing and being provided with a helical groove, said groove cooperating with a cylindrical surface, said surface surrounding said shaft, characterized in that the groove thread with respect to the direction of rotation of the shaft is always such that the groove carries medium from the housing beyond

the confines of the seal, from the high-pressure region to the low-pressure space, and the cylindrical surface surrounding



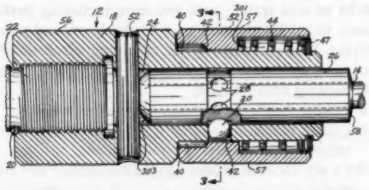
the shaft is constituted by a flexible sleeve, the outer surface of said sleeve being under the pressure of the space to be sealed.

4,273,344

MOTOR QUICK-CHANGE CHUCK SYSTEM FOR TOOL HAVING CYLINDRICALLY SHAPED ADAPTER PORTION

Richard L. Benson, Mercer Island; Horace E. Hill, Renton, and Mark S. Soderberg, Bellevue, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 932,593, Aug. 8, 1978, Pat. No. 4,184,692. This application Jun. 4, 1979, Ser. No. 45,483
The portion of the term of this patent subsequent to Jan. 22, 1997, has been disclaimed.
Int. Cl.³ B23B *31/22*
U.S. Cl. 279—75 **1 Claim**



1. A tool-holding chuck assembly having a generally cylindrically shaped body member, said generally cylindrically shaped body member having a hollow first end portion, said hollow first end portion having an inner wall surface threaded to accept the mating threaded spindle of a portable motor, said generally cylindrically shaped body member having a hollow second end portion concentrically disposed relative to said hollow first end portion, said generally cylindrically shaped body member including a roll pin depth stop disposed between said hollow first end portion and said hollow second end portion;

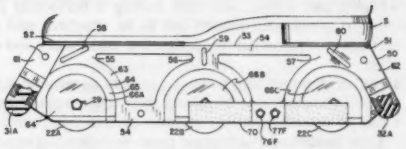
said tool-holding chuck assembly including three cylindrically shaped ball elements, a collar member **(32)** having an internal shoulder **(301)**, a recess **(40)** formed in the inner wall surface thereof, a retaining ring **(47)**, a spirally wound spring member **(44)** disposed between said retaining ring **(47)** and said internal shoulder **(301)**, said collar member **(32)**, retaining ring **(47)**, and spirally wound spring member **(44)** coaxially disposed about the central axis of said tool-holding chuck assembly, said collar member **(32)** adapted to be moved axially for compressing spirally wound spring member **(44)** between said retaining ring **(47)** and said internal shoulder **(301)** thereby positioning said recess **(40)** for receiving said three cylindrically shaped ball elements.

4,273,345

ROLLER SKATE

Effraim Ben-Dor, P.O. Box 33372, Tel-Aviv, Israel, and Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Filed Oct. 2, 1978, Ser. No. 948,029
Int. Cl.³ A63C *17/06, 17/14*
U.S. Cl. 280—11.2 **5 Claims**



1. A roller skate comprising:

A skate wheel support having an upper portion including laterally extending flange portions adapted to be secured to the bottom of a shoe,

said support having a downwardly extending wheel supporting portion,

the lower portion of said wheel supporting portion having a plurality of cowl portions each defined by space-separated outwardly extending and downwardly depending opposite wall portions spaced apart from each other at the bottom of said wheel supporting portion and extending in longitudinal alignment with each other so as to define a plurality of wheel housings, each of which is open at the bottom of said wheel supporting portion of said support,

a plurality of wheels extending in a row along the lower portion of said support with each wheel supported in bearing within each of said cowl portions of said support by the opposite walls thereof for supporting and providing wheeled movement of said skate across a surface, and

a braking member secured to and supported by the sidewall of said support and having an outer surface of friction producing material which braking member is shaped and positioned to permit said outer surface to be engaged against the surface on which the skate is used to the exclusion of all other portions of said skate for slowing down and stopping movement of the skater along such skating surface.

4,273,346

OVER-THE-COUNTER CART WITH HINGEDLY ATTACHED PLASTIC BASKET AND RETRACTING FRONT GATE

Houston Rehrig, 1401 S. Oak Knoll Ave., Pasadena, Calif. 91109

Filed Mar. 6, 1979, Ser. No. 18,028
Int. Cl.³ B62B *3/08*
U.S. Cl. 280—33.99 F **38 Claims**

1. A plastic basket for use with a wheeled over-the-counter cart frame having a horizontal frame portion to which said basket is to be attached, comprising:

a pair of opposed side panels, a bottom panel, and a front panel attached together along their contiguous edges, said side panels and said bottom panel terminating in a rear edge, a channel extending from the underside of said bottom panel adjacent its rear edge and continuing up and along said side panels adjacent their rear edges,

a pair of spaced, parallel shoulders on said side panels, said front panel and said bottom panel to define said channel for receiving a reinforcing means for reinforcing said basket, said channel having a widened section, said section extending from the underside of said bottom panel to a position on the lower portion of said side panels adjacent their rear edge, and wherein said channel widened section also receives a hinge means, attached to said reinforcing means, for hingedly attaching said basket to said horizon-

tal frame portion and to provide added stiffness to the basket,

said reinforcing means being adapted to attach said basket to said horizontal frame portion of the over-the-counter cart frame, and

a hinge member mounted to said horizontal frame portion for hingedly receiving said hinge means.

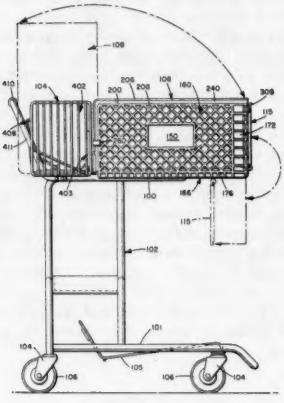
26. A cart having separate rear and front baskets for use with a wheeled cart frame, said cart having a horizontal frame portion to which said baskets are to be attached, said front basket being constructed of plastic open latticework and comprising:

a pair of opposed side panels, a bottom panel, and a front panel attached together along their contiguous edges,

a pair of spaced, parallel shoulders on said side panels, said front panel and said bottom panel to define a channel for receiving reinforcing means, said reinforcing means being adapted to attach said basket to said horizontal frame portion,

said rear basket having a rear and forward portion and being attached to said horizontal frame portion in such a manner to prevent relative movement of said rear basket with respect to said horizontal frame portion,

said rear basket comprising: a pair of opposed stationary side panels, a stationary rear panel, a stationary bottom panel



and a seat back panel, and further comprising rail means attached to said stationary side panels for pivotally attaching said seat back panel to said rear basket, a pair of spaced upwardly inclined rear posts having a handle carried by said posts, said posts extending through said stationary rear panel and being attached to said horizontal frame portion,

a child's seat pivotally attached to said stationary bottom panel at the rear portion of said rear basket,

said stationary rear panel comprising at least one leg opening for accomodating the legs of a child sitting in said child seat, said child seat adapted to be movable between a first position in juxtaposition to said stationary bottom panel and a second position covering said leg openings,

said seat back panel is movable between a first seat back position substantially perpendicular to said stationary bottom panel and a second seat back position and juxtaposition to said stationary bottom panel,

said stationary side panels having at the forward portion of said rear basket a horizontal cross-sectional configuration comprising an inwardly curved section, and,

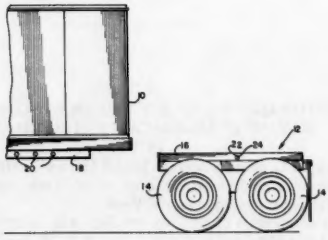
said rail means comprising a first bar having a first loop-shaped end defining a first opening, said first loop-shaped end being attached to said curved section of one of said stationary side panels, the other end of said first bar extending towards the rear portion of said rear basket and having a section thereof inclined upwardly.

4,273,347

INTERLOCK SYSTEM FOR A TRAILER AND BOGIE

David O. Hulse, Lionville, Pa., assignor to The Budd Company, Troy, Mich.

Filed Sep. 24, 1979, Ser. No. 77,897
Int. Cl.³ B62D *27/04*
U.S. Cl. 280—80 B **9 Claims**



1. In combination with a tractor driven trailer having a pair of tracks with spaced apertures secured thereto, a structure having a plurality of wheels for supporting said trailer and having a pair of rail elements for slidable mounting to the tracks of said trailer, said structure including parking brake means to inhibit rotation of the wheels on said structure and parking brake chambers for receiving air pressure from a source of air pressure to selectively overcome the braking of said parking brake means;

a locking mechanism comprising:

(a) guide means having an opening therein secured to said structure for receiving a pin element;

(b) a pin element secured to said structure and disposed to move within the opening of said guide means;

(c) means for moving said pin within the opening of said guide means from at least one of said rails into a selected one of said plurality of apertures in one of said tracks to secure said structure to said trailer;

(d) means for connecting air pressure from said source into the opening within said guide means;

(e) means for connecting said opening within said guide means to said brake chambers;

(f) means associated with said pin element including a pair of spaced flexible ring elements extending around said pin and dimensioned to compress when inserted into the opening in said guide means to provide a sealed chamber between said ring elements with said guide means within said opening;

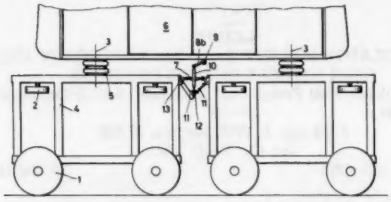
(g) said sealed chamber being alignable with said means for connecting air pressure and means for connecting said opening when said pin is inserted from one of said rails through said selected one aperture of one of said tracks to permit air pressure to pass from said source through said sealed chamber into said brake chambers, with no air pressure being applied from said source to said brake chambers when said pin is not inserted from said one rail through said selected one aperture in said one of said tracks and said sealed chamber is misaligned with respect to the means for connecting said air pressure and said means for connecting said opening.

4,273,348

ROLL STABILIZING APPARATUS FOR VEHICLES

Martin Middeldorf, Waltrop, Fed. Rep. of Germany, assignor to DeMag Aktiengesellschaft, Duisburg, Fed. Rep. of Germany

Filed Feb. 23, 1979, Ser. No. 15,604
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1978, 2807765
Int. Cl.³ B62D 63/04
U.S. Cl. 280—112 A 6 Claims



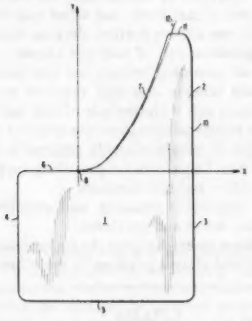
1. Apparatus for vehicles to accommodate centrifugal forces when the vehicle is traversing a curve, comprising
(a) a vehicle chassis;
(b) a pair of spaced undercarriages for said chassis;
(c) each undercarriage pivotal on a vertical axis on said chassis; the improvement characterized by
(d) first mechanical linkage means disposed between said spaced undercarriages and moving in response to relative horizontal displacement between said undercarriages when traversing curves; and
(e) second mechanical linkage means disposed between said first mechanical linkage means and said chassis for transposing said movement of said first mechanical linkage means into relative vertical displacement between said undercarriages and said chassis.

4,273,349

MUD FLAP

Knut Arenhold, Westend 7, 2000 Hamburg 52, Fed. Rep. of Germany

Filed Jul. 16, 1979, Ser. No. 57,681
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1979, 2906545
Int. Cl.³ B62D 25/16
U.S. Cl. 280—154.5 R 5 Claims



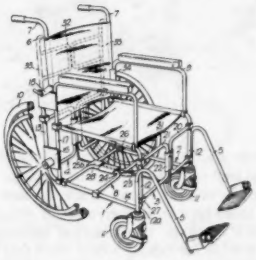
1. A flexible mud flap for securing to the fender of a vehicle, comprising:
(1) a main body portion having a generally horizontally disposed lower edge, generally vertically disposed inside and outside edges, and a generally horizontally disposed upper edge;
(2) an additional body portion disposed generally vertically above the main body portion and having a generally parabolically curved inner edge such that the vertex of the parabola lies on the upper edge of the main body portion and the distance between the vertex and the inside edge of the main body portion is approximately 0.3 to 0.4 of the distance between the inside and outside edges of the main body portion, the half parameter of the parabola being between p=3.5 and p=4.0 centimeters, and said curved inner edge adapted to be attached to the fender welt;
whereby the mud flap is securable to curved fenders.

4,273,350

FOLDING WHEELCHAIR

Patrick Y. Williams, Golden Eagles Flats, 6 Fawcett St., Ballina, New South Wales, Australia (2478)

Filed Mar. 5, 1979, Ser. No. 17,704
Claims priority, application Australia, Mar. 15, 1978, PD3730
Int. Cl.³ B62M 1/14
U.S. Cl. 280—242 WC 14 Claims



1. In a folding wheelchair comprising first and second side frames mounted on wheels, a folding seat extending between the side frames, and toggle brace assemblies pivotally connected to and extending between the side frames, the improvement comprising providing said toggle brace assemblies as front, rear and bottom toggle brace assemblies respectively pivotally connected to and extending between front, rear and bottom portions of the side frames, each toggle brace assembly being foldably displaceable between a bracing position in which the side frames are held apart and a folded position in which the side frames move adjacent to one another, and holding means for the front and rear toggle brace assemblies, the holding means being engageable with the bottom toggle brace assembly when in the bracing position to hold the front and rear toggle brace assemblies against folding displacement until commencement of folding of the bottom toggle brace assembly.

4,273,351

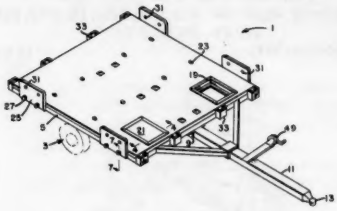
MULTIPURPOSE TRAILER

Michael G. Salamander, 16 Dunsbach Ferry Rd., R.D. #, Cohoes, N.Y. 12047

Filed Jul. 20, 1979, Ser. No. 59,558
Int. Cl.³ B60P 3/10
U.S. Cl. 280—414 R 1 Claim

1. A multipurpose trailer for use as a flat-bed trailer and being adaptable for conversion for use as a boat trailer, for use as a tent trailer, for use as a utility or box trailer, and for mounting and transporting motorcycles or snowmobiles, said trailer having a wheeled undercarriage and a drawbar, said wheeled undercarriage having a tubular frame carrying a fixed, flat-bed platform, said tubular frame having a frame support complemenatally receiving therein said drawbar, said frame support pivotally mounting said drawbar at its other end to permit said wheeled undercarriage to tilt upwards to facilitate loading of a boat, motorcycle or snowmobile onto said flat-bed platform, said fixed, flat-bed platform having formed therein zees

constituting open wheel wells for receiving therein in disposed relationship the front wheels of motorcycles, said wheel wells when not in use receiving flat cover plates to render said flat-bed platform flat, said frame carrying hold-down plates, said hold-down plates having aligned holes for mounting hold-down bars disposed in securing relationship with the skis of a snowmobile to mount said snowmobile, said trailer being convertible for use as a utility or box trailer by vertically upstanding side-forming and end-forming members, said holes of said hold-down plates being utilized to bolt thereto said side-forming members, said end-forming members having stakes, said frame having sockets or brackets, said sockets or brackets complementally receiving in mounting relationship said stakes of said end-forming members, said trailer being convertible for



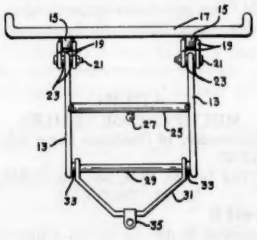
use as a boat trailer by means of keel-roller assemblies and cradles, said keel-roller assemblies having side walls for mounting disposition in said frame brackets, said cradles having depending stake-type legs receivable for mounting disposition in said frame brackets, said drawbar mounting a winch for providing a cable for raising a boat onto said trailer, securing same to said trailer and lowering same from said trailer, said trailer being convertible for use as a tent trailer by said frame having corner sockets or brackets for adjustable mounting disposition of leveling legs, said platform being leveled by appropriate vertical disposition of said leveling legs, said frame having formed therein frame-support sockets or brackets for receiving in mounting relationship the end of tent frames to thereby mount same.

4,273,352

COMBINATION PUSH AND TOW BAR

Lyle A. Jorgenson, 7420 S. 1025 E., South Weber, Utah 84403

Filed Jul. 18, 1979, Ser. No. 58,419
Int. Cl.³ B60D *1/06, 3/00*
U.S. Cl. 280—481 **2 Claims**



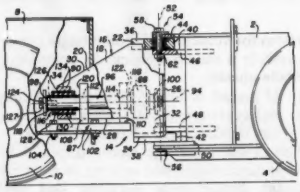
1. A combination push and tow bar for attachment to the front of a carrying vehicle comprising, a pair of mounting bars extending outwardly and upwardly from the front of the vehicle, said mounting bars being spaced apart in parallel relationship, means for pivotably attaching said mounting bars to the front of the vehicle, a first transverse brace member positioned between said mounting bars approximately half-way along the length thereof, a second transverse brace member positioned between said mounting bars at the outer ends thereof, a U-frame pivotably attached to said second transverse brace member at the outer ends of said mounting bars, a coupler attached to the outer apex of said U-frame for engagement with a ball on another vehicle, and a ball fixedly attached to said first transverse brace at the midpoint thereof, said coupler on said U-frame engaging said ball on said first transverse brace for locking said U-frame in the downward position when said push and tow bar with said mounting bars upwardly oriented is in the push mode of operation and not in engagement with a towing vehicle.

4,273,353

ARTICULATOR FOR INTERCONNECTING FRONT AND REAR VEHICLE CHASSIS PORTIONS

John Holmes, 3380 Francis Rd., Richmond, British Columbia, Canada

Filed Apr. 5, 1979, Ser. No. 27,528
Int. Cl.³ B60D *1/00*
U.S. Cl. 280—483 **16 Claims**



12. An articulator for interconnecting front and rear chassis portions of a vehicle, comprising:

(a) a frame,

(b) a pair of spaced apart mounting holders affixed to said frame;

(c) a pair of insert enclosures each affixed to an associated one of said mounting holders;

(d) a pair of resilient inserts each bonded to an interior surface of an associated one of said insert enclosures;

(e) a pair of cylindrical mounting sleeves each fitted into an opening in and bonded to an associated one of said resilient inserts and such that the interior bores of said sleeves are axially aligned;

(f) a pair of spaced apart brackets affixable to one end of one of said front and rear chassis portions, said brackets having circular apertures of substantially the same diameter, as the diameter of said bores and when said brackets are affixed to said one chassis portion, they are axially aligned along a longitudinal axis of said one chassis portion, the spacing of said mounting holders and said brackets being such that said holders and said brackets are alignable along a common axis with one pair of said pair of holders and brackets interposed between the other of said pairs;

(g) a coupling shaft snugly, slidably receivable by said respective bores and apertures for providing support to said mounting holders and said brackets;

(h) means for releasably retaining said coupling shaft in position in said bores and apertures,

whereby said resilient insert dampens the transmission of vibrations from one of said chassis portions to the other.

4,273,354

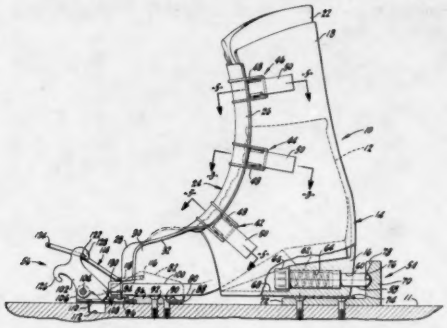
CONVERTIBLE SKI BOOT AND BINDING EQUIPMENT

Frederick W. George, P.O. Box 9246, Tahoe Valley Pharmacy, S. Lake Tahoe, Calif. 95731

Filed Feb. 21, 1979, Ser. No. 13,380
Int. Cl.³ A63C *9/08*
U.S. Cl. 280—614 **5 Claims**

1. Combination ski boot and binding equipment for use with boots of the tour skiing type, including the combination of a ski boot shell, means for detachably mounting the shell about the

boot for use during Alpine skiing and when the shell is detached the heel of the boot is released from the skii for use during tour skiing, heel binding means for releasably holding the heel of the shell on the ski for use during Alpine skiing, toe binding means operable between a first mode for releasably holding the toe of the boot on the ski for use during Alpine skiing and a second mode for locking the toe of the boot on the



ski for use during tour skiing, said shell including a support for the heel of the boot and upstanding substantially rigid sides for supporting the sides of the boot, together with a tongue having an upper portion extending across the front of the boot and overlapping with the sides of the shell, said tongue including a lower portion extending over the toe of the boot and with the toe binding means locking the tongue lower portion.

4,273,355

SKI SAFETY BINDING

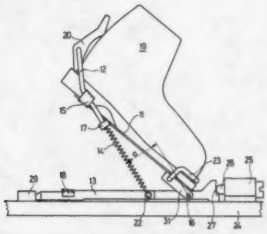
Ralf Storandt, Leonberg, Fed. Rep. of Germany, assignor to Vereinigte Baubeschlagfabriken, Gretsch & Co. GmbH, Leonberg, Fed. Rep. of Germany

Filed Sep. 28, 1979, Ser. No. 80,015

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1978, 2846914

Int. Cl.³ A63C *9/086*

U.S. Cl. 280—614 **23 Claims**



1. A ski safety binding which is convertible between downhill and touring configurations, the binding comprising a base plate connectable via a safety release mechanism to a ski, a sole plate to which a ski boot can be fastened arranged for pivotal movement about a transverse pivot axis on the base plate to define said touring configuration and at least one fitting provided on at least one side of the binding for securing the sole plate to the base plate in the downhill configuration, said fitting comprising a link incorporating a spring member at its forward portion and extending at least between a point of attachment at the forward part of the base plate and a point at which it is held to the side of the sole plate at the rear portion thereof, a projection on the base plate and which is disposed between said point of attachment and the point at which the link is held to the sole plate and somewhat below the latter and an abutment on the link which is located in front of and close to the projection when, to define the downhill configuration, the link is engaged beneath this projection.

4,273,356

REAR WHEEL SUSPENSION DEVICE FOR VEHICLES

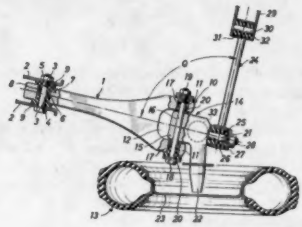
Mamoru Sakata, Tokyo; Yozo Kami, Sakado, and Tetsuro Mitsui, Shihi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 23, 1979, Ser. No. 68,759

Claims priority, application Japan, Dec. 28, 1977, 52/179474[U]

Int. Cl.³ B60G *3/20*

U.S. Cl. 280—675 **5 Claims**



1. A rear wheel suspension device for vehicles comprising:

a radius rod extending substantially in the longitudinal direction of the vehicle body, said radius rod being inclined with respect to the axis of the vehicle body;

a lower arm extending substantially in the transverse direction of the vehicle body;

said radius rod and said lower arm each supporting at one end an axle member of a rear wheel;

said lower arm being inclined with respect to the axis of the rear wheel axle;

said radius rod extending at an angle of 90 degrees to said lower arm;

a rubber bush for supporting said radius rod on the vehicle body, said bush being formed to be relatively highly resilient in the back-and-forth direction of the rear wheel, and relatively substantially less resilient in the transverse direction of the rear wheel; and

a rubber bush for supporting said lower arm, said rubber bush being substantially non-resilient so as to substantially rigidly support said lower arm in the transverse direction of the rear wheel.

4,273,357

VEHICLE SUSPENSION SYSTEM

William B. Pashkow, Toledo, Ohio, assignor to Sheller-Globe Corporation, Toledo, Ohio

Filed Feb. 21, 1979, Ser. No. 13,207

Int. Cl.³ B60G *11/34*

U.S. Cl. 280—697 **17 Claims**

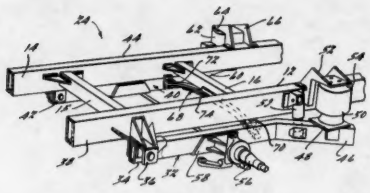
1. In a vehicle having a suspension system comprising a frame including first and second spaced elongated side rail members and transversey extending interconnecting members secured to said side rail members, an axle assembly, means provided on said axle assembly for securing ground engaging wheels thereto and suspension means for movably mounting said axle assembly to said vehicle frame, said suspension means comprising:

a first traillling arm member having one end pivotably secured to one of said side rails;

a second trailing arm member having one end pivotably secured to the other of said side rails;

means securing said axle assembly to said first and second trailing arms;

first spring means extending transversely relative to said frame and having opposite end portions connected to respective of said first and second trailing arm members, and an intermediate portion secured directly to an intermediate portion directly to said frame, said first spring means being operative to inhibit lateral movement of said



frame relative to said axle and to in part resiliently support said frame upon said axle assembly; and

a pair of second spring means, one of said pair of second spring means extending between said first trailing arm member and said frame and the other of said second pair of spring means extending between said second trailing arm member and said frame, said second pair of spring means being operative to primarily resiliently support said frame on said axle assembly.

4,273,358

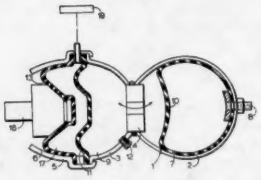
SUSPENSION MEANS FOR VEHICLES

Phillip A. Taft, Solihull, England, assignor to Girling Limited, Birmingham, England

Filed Apr. 2, 1979, Ser. No. 25,862

Int. Cl.³ B60G *11/30*

U.S. Cl. 280—708 **5 Claims**



1. Hydro-pneumatic suspension means for a vehicle comprising in combination a housing assembly and a piston member, said housing assembly and said piston member being adapted for connection between sprung and unsprung parts of a vehicle and being relatively movable in response to relative movement between the sprung and unsprung parts, wherein the housing assembly incorporates a pressure chamber containing a trapped volume of gas under pressure which defines a gas spring for supporting the load on a wheel or axle of the vehicle, a working chamber containing a trapped constant volume of liquid, a height adjusting chamber to which liquid is supplied to compensate for changes in the pressure in the pressure chamber due to changes in the loading on the vehicle, a first flexible diaphragm for separating said gas in said pressure chamber from said liquid in said working chamber, a second flexible diaphragm for separating said trapped volume of liquid in said working chamber from any liquid in said height adjusting chamber so that no transfer of liquid between said working chamber and said adjusting chamber can take place, a third diaphragm disposed between said piston member and said housing assembly and through which oscillations between said piston member and said housing assembly are transmitted to said gas spring by displacement of said liquid in said working chamber, and damping valve means separate from said piston member and disposed within said working chamber, said liquid in said working chamber being forced through said valve means to damp out oscillations of said gas spring in response to relative movement between the sprung and unsprung parts, and wherein a supply of liquid of which the pressure can be altered to compensate for changes in the pressure in said pressure chamber due to changes in the loading on the vehicle is provided for supply to said height adjusting chamber, whereby a ride height for the vehicle can be maintained substantially at a constant value.

4,273,359

DEFORMATION MEMBER ARRANGED IN THE IMPACT AREA OF THE KNEE

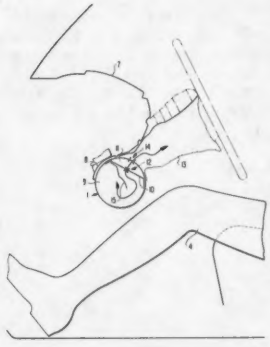
Hansjürgen Scholz, Echterdingen; Hans-Gerd Backhaus, Stuttgart, and Luigi Brambilla, Böblingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 1,165, Jan. 5, 1979, which is a continuation of Ser. No. 768,344, Feb. 14, 1977. This application Dec. 20, 1979, Ser. No. 105,706

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1976, 2606640

Int. Cl.³ B60R *21/08*

U.S. Cl. 280—740 **19 Claims**



1. An impact absorbing device for engagement by knees of an occupant of a vehicle during collision, the device comprising a plastically deformable, hollow body member extending in a vehicle transverse direction, said member having an impact engaging surface facing said knees, said surface having a rounded-off cross sectional profile and vertically extending corrugations whereby said member yields only locally upon engagement by said knees.

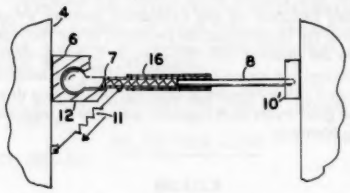
15. An impact absorbing device according to claim **1**, wherein a channel means is located outside of the impact engaging surface and is provided with openings directed toward the hollow space, said channel means being adapted to supply a gas to the hollow space.

19. An impact absorbing device according to claim **15**, wherein openings directed toward a head space of the vehicle are provided in the channel means through which the gas passes over into an inflatable bag serving for absorbing an upper body of a passenger of the motor vehicle.

4,273,360
SAFETY BAR FOR FIRE TRUCKS

John McLoughlin, 92 Mobrey La., Smithtown, N.Y. 11787; Yehuda Rotblum, 7 Williams Blvd., Lake Grove, N.Y. 11755, and Neocles Athanasiades, 2 Bluff La., Setauket, N.Y. 11785

Filed Feb. 7, 1979, Ser. No. 10,178
Int. Cl.³ B60R *21/10*
U.S. Cl. 280—751 4 Claims

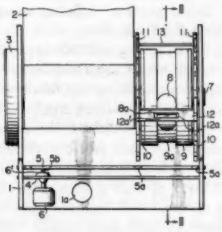


1. Safety bar for a truck of the type having an open space behind the cab for carrying men comprising:
a bar to protect men from falling out from said space,
means to mount the bar to extend across the space and for movement upwardly and inwardly with respect to the truck,
and means to restrain the bar from movement downwardly from horizontal position and outwardly with respect to the truck,
wherein the bar comprises:
inner and outer telescoping portions,
means to spring load the inner portion to push it to the extended position,
and means to spring load the bar in a downward direction and means to spring load the bar in an outward direction against stops.

4,273,361
SEAT BELT SYSTEM FOR VEHICLE

Toshihiro Takei, Okazaki; Satosi Kuwakado, Aza Mitsuishi; Eiji Takakuwa, and Toshiaki Shimogawa, both of Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jul. 31, 1978, Ser. No. 929,782
Claims priority, application Japan, Aug. 5, 1977, 52-105467[U]
Int. Cl.³ B60R *21/10*
U.S. Cl. 280—805 5 Claims

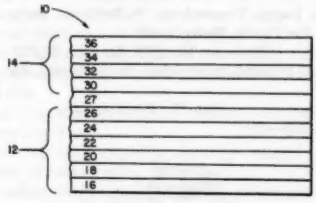


1. A seat belt system for a vehicle comprising:
a seat belt for restraining an occupant;
seat belt anchor means adapted to be firmly secured to a vehicle body; and
an impact energy absorbing device interposed between said seat belt and said seat belt anchor means to connect them, said impact energy absorbing device comprising
a cutter having a cutting edge formed with an arcuate portion at its shearing part,
a member connected to said seat belt to be moved thereby when collision occurs and disposed in juxtaposed relation to said cutter and having a recessed U-shaped groove formed therein to provide a portion of constant reduced thickness adapted to be sheared by said cutter during movement of said member against said cutter, and
a cutter supporting member for supporting said cutter such that said cutter is held stationary when collision occurs, whereby said cutter shears said member when the vehicle collides to thereby absorb the impact energy acting on the seat belt,
said cutter further having a first guide portion disposed flat in said U-shaped groove and extending therein in a direction opposite to said movement of said member so as always to be upstream of said cutting edge to keep said cutter in proper cutting position,
said cutter further having a second guide portion on the opposite end of said cutting edge from said first guide portion and extending at an angle thereto with an arcuate surface which continues the said arcuate portion of said shearing part for coiling the shorn reduced thickness portion into a tight coil on the side of said reduced thickness portion opposite said U-shaped groove.

4,273,362
INFORMATION-BEARING ARTICLE FOR CONVEYING INFORMATION WHICH CANNOT BE SURREPTITIOUSLY DETECTED

Lee A. Carrier, Longmeadow, and Leon G. Carpenter, Wilbraham, both of Mass., assignors to Ludlow Corporation, Needham Heights, Mass.

Division of Ser. No. 685,646, May 12, 1976, Pat. No. 4,120,445. This application Apr. 21, 1978, Ser. No. 898,658
Int. Cl.³ B42D *15/00*
U.S. Cl. 283—6 10 Claims



1. An indicia-bearing article of the type wherein said indicia is not readily detectable except by irreversible alteration of the article, said article comprising
(a) an indicia-bearing sheet, said sheet comprising
(1) a substrate sheet forming a mechanically stable means for manipulating and handling said indicia-bearing sheet and
(2) a release coating between said substrate sheet and an indicia-bearing surface of said indicia-bearing sheet;
(b) a cover sheet that is adhesively laminated to said indicia-bearing sheet and forms means to hide said indicia;
(c) said release coating forming means to cause preferential delamination of said article along a plane formed by said release coating before any delamination takes place at along said indicia-bearing surface.

4,273,363
INSULATED FLEXIBLE PIPE COUPLING

Richard R. Angel, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

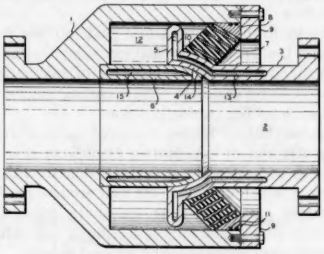
Filed Jun. 27, 1979, Ser. No. 52,535
Int. Cl.³ F16L *27/10, 59/14*
U.S. Cl. 285—47 13 Claims

1. A flexible pipe coupling comprising:

an annular housing with a central cavity and a housing end flange,

a nipple partially submerged in said cavity with the nipple 5 having a spherically flared end on the submerged portion, and a radially outwardly extending flange on the lower extremity of the submerged, flared portion of the nipple,

an annular, elastomeric seal assembly located exteriorly of the flared end of the nipple and extending between the



nipple end and the housing end flange thereby closing said cavity,

means located internally of the flared end wherein the means bridges the nipple and housing thereby providing a constant inside diameter for said coupling,

insulation means disposed in the nipple to thereby reduce the heat flow to the elastomeric seal located outside the nipple of the flexible coupling from fluid passing through the pipe coupling.

4,273,364

BRANCH PIECE

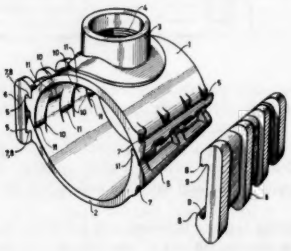
Tinus de Lange, Vroomshoop, Netherlands, assignor to Wavin B.V., Em Zwolle, Netherlands

Filed Apr. 10, 1979, Ser. No. 28,829

Claims priority, application Netherlands, Apr. 10, 1978, 7803785

Int. Cl.³ F16L *41/00*

U.S. Cl. 285—197 **6 Claims**



1. A branch piece for providing pipe-lines with branches, comprising:

a first part with a branch opening in a wall surface;

a second part, together with the first part, adapted to surround a pipe-line;

C-shaped means for connecting said first part and said second part together on the outside;

each part being provided with axially spaced projections in the vicinity of opposite coupling edges adapted to support said connecting means;

said projections being adapted to fit in axially spaced recesses of each part in the vicinity of said opposite coupling edges of each part and also being adapted to co-operate with said connecting means;

wherein the projections have the shape of wedge-shaped tongues while the recesses interacting therewith have complementary wedge-shapes;

wherein, in cross-section of a cylindrical housing formed by the two parts, said wedge-shaped tongues and recesses extend along the cylindrical housing;

wherein the opposite coupling edges co-operating with the connecting means are provided with grooves, the bottom of said grooves being able to support the connecting means, said grooves being located in the closing or connecting direction of the cylindrical housing above the roots of the tongues and the entrances of the recesses; and

wherein the grooves corresponding to a wedge-surface of the connecting means extend slopingly in the longitudinal direction of the cylindrical housing, said sloping direction of the grooves on each opposite side of each separate part being identical.

4,273,365

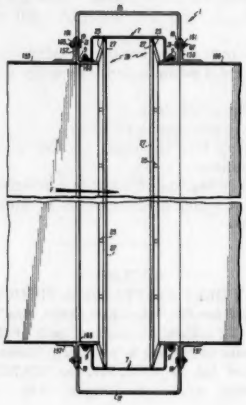
EXPANSION JOINT AND FABRIC THEREFOR

Donald K. Hagar, 2439 Walnut St., Allentown, Pa. 18104

Filed May 18, 1979, Ser. No. 40,736

Int. Cl.³ F16L *51/02*

U.S. Cl. 285—229 **30 Claims**



1. An expansion joint for accommodating relative movements between a plurality of elements through which a fluid flows, the joint comprising:

(a) a flexible fabric portion defining an enclosed passage through which fluid may flow;

(b) first means for attaching said fabric portion to one of the elements through which the fluid flows;

(c) second means for attaching said fabric portion to another of the elements through which the fluid flows;

(d) said fabric portion extending between said first and second attaching means, said fabric portion including:

(1) a first layer of high temperature resistant material;

(2) a second layer of high temperature resistant material;

(3) an inner metallic foil disposed between said first and second layers of high temperature resistant material;

(4) means for preventing creasing and rupture of said inner metallic foil, due to excessive folding and wrinkling of said fabric portion, by partially stiffening said layers of heat resistant material to such an extent that said excessive folding and wrinkling is prevented but not to such extent that relative movement between the plurality of elements is hampered; and

(5) said preventing means including a first metallic foil, other than said inner metallic foil, affixed to said first layer of high temperature resistant material to provide a first foil-fabric composite and a second metallic foil,

other than said inner metallic foil, affixed to said second layer of high temperature resistant material to provide a second foil-fabric composite, said first and second metallic foils each having a thickness greater than 0.0005 inches.

4,273,366

TWO-PART FLUID CONDUIT WITH MEANS FOR CONNECTING THE SECTIONS THEREOF

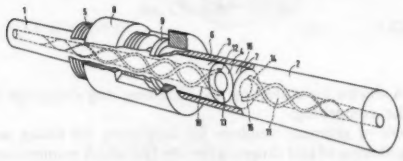
Olov Ekström, Brottby, and Kenth Nilsson, Akersberga, both of Sweden, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 17, 1978, Ser. No. 887,480

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1977, 2715270

Int. Cl.³ F16L *25/00*

U.S. Cl. 285—332 **5 Claims**



1. A two-part fluid conduit assembly comprising first and second conduit sections with proximate connected ends and each having a remote end remote from the proximate end thereof, said proximate ends having means providing a sealed connection of said conduit sections, the proximate end of the first section being tapered externally and having an inner wall defining a fluid passage therein, and an annular terminal surface, the proximate end of the second conduit section having an internally conical section tapering off at its proximate end, having an inner wall defining a fluid passage and having an interior ledge at which the fluid passage terminates, the proximate end of the first conduit section fitting into the proximate end of the second conduit section so that with a tight connection of the conduit sections the annular terminal surface is in spaced relation from the interior ledge to provide a fluid receiving space (**16**) therebetween, said first and second conduit sections together forming a fluid conduit to be filled with a coupling fluid for transmitting a pressure to be measured, one of said conduit sections when filled with said coupling fluid leading via the remote end thereof to a patient for the sensing of the pressure of body fluids, the other of said conduit sections when filled with said coupling fluid leading via the remote end thereof to a pressure sensor,

(a) the inner walls defining the fluid passages of said first and second conduit sections being of constant and equal diameter over the entire extent of said fluid conduit between said remote ends except at said fluid receiving space,

(b) the fluid receiving space (**16**) directly adjoining the fluid passages of said constant and equal diameter, an interior wall of the proximate end of said second conduit section defining an outer margin of said fluid receiving space (**16**) and being of larger diameter than the constant and equal diameter of said fluid passages (**10, 11**),

(c) at least one of said conduit sections (**1, 2**) having helical groove means (**12, 13, 14, 15**) formed along the inner wall thereof of said constant and equal diameter and functioning solely to produce rotation of the coupling fluid during filling of said fluid conduit and not for mechanical connection of the fluid conduit,

(d) means whereby said helical groove means are of fixed length along said fluid conduit independent of the proximity of the fluid passages of said constant and equal diameter and independent of the degree of tightness of said tight connection, and the fixed length and location of said helical groove means relative to said fluid receiving space (**16**) being such that the coupling fluid when filled into said fluid conduit from one of said remote ends is caused to rotate as it flows through said fluid receiving space to insure removal of air bubbles from the entirety of said fluid conduit.

4,273,367

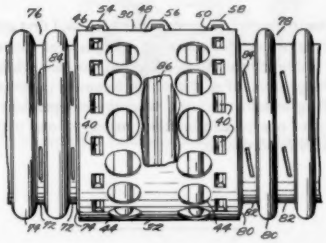
PIPE COUPLING

Gary E. Keeney; Allen K. Zurcher, and Ervin C. Loomis, all of Greene, Iowa, assignors to Plasta-Plug, Inc., Greene, Iowa

Filed Feb. 21, 1978, Ser. No. 879,627

Int. Cl.³ F16L *21/06*

U.S. Cl. 285—419 **22 Claims**



1. A one-piece pipe coupling for joining abutting sections of annularly corrugated non-metallic pipe having annular grooves and lips comprising:

(a) a substantially rectangular non-metallic pipe coupling body having two ends and a resilient center portion radially deformable to form a sleeve member;

(b) a first single row of ribs disposed along the length of said coupling body and adjacent to a first side of said coupling body;

(c) a second single row of ribs disposed along the length of said coupling body and adjacent to a second side of said coupling body and substantially parallel to said first single row of ribs;

(d) at least two strap projections integral with one end of said coupling body;

(e) at least two strap engaging openings integral with the other end of said coupling body; and

(f) independent tensioning and securing means provided in said strap projections and strap engaging openings cooperating with said first single row of ribs and said second single row of ribs and said resilient center portion to tension and secure said sleeve member around each abutting section of annularly corrugated pipe to the maximum extent permitted by the outside diameter and groove configuration of said pipe by forcing said first single row and second single row of ribs in securement with one corrugation of each abutting section of said pipe while providing a flexible joint by allowing cooperation between said first single row and second single row of ribs and said resilient center portion.

4,273,368

DUAL LATCHING MECHANISM FOR A FLEXIBLE DECK LID

Akira Tanaka, Northridge, Calif., assignor to American Safety Equipment Corporaion, San Fernando, Calif.

Filed Jul. 6, 1979, Ser. No. 55,183

Int. Cl.³ E05C *3/26, 9/00*

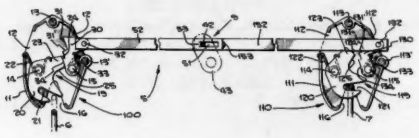
U.S. Cl. 292—53 **13 Claims**

1. A dual latching mechanism for latching two spaced locations of a flexible lid to a pair of similarly spaced anchors of a compartment to which said lid is movably mounted, said latching mechanism comprising:

first and second latching means for latching to said anchors

said first and second latching means being individually actuated to latching positions by each striking said anchors;

mounting means for mounting said latching means to said flexible lid at spaced locations thereon; and



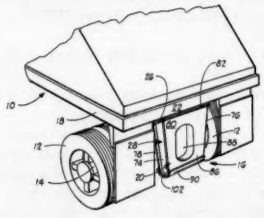
latch control means connected between said first and second latching means for allowing independent movement of said latching means to said latching position while limiting latching action of said latching means to concurrent only latching to said sanchors, whereby independent latching of either one of said latching means to one only of said anchors is prevented.

4,273,369

REVERSIBLE PUSH BLOCK-REAR BUMPER ASSEMBLY

Glen F. Rosenbaum, Elk Point, S. Dak., assignor to CMI Corporation, Oklahoma City, Okla.

Filed Aug. 6, 1979, Ser. No. 63,959
Int. Cl.³ B60R *19/00*
U.S. Cl. 293—1 **5 Claims**



1. A reversible push block-rear bumper assembly for a wheeled vehicle which comprises:

(a) support means secured to the underside of the vehicle in close proximity to the rear end portion of the vehicle, said support means having a forwardly inclined downwardly extending support surface;

(b) block means having an upper end portion and a lower end portion maintained in a separate spatial relationship, said upper end portion having an inclined connecting surface for mating with the support surface of said support means so that in a first position said block means extends downwardly from said support means in a plane substantially perpendicular to the longitudinal axis of the vehicle and in a second position extends rearwardly from the rear end portion of the vehicle; and

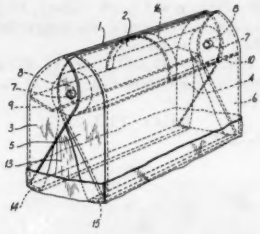
(c) first fastening means for detachably securing the inclined connecting surface of said block means to the support surface of said support means so that the block means is positioned in a selected one of the first and second positions.

4,273,370

DEVICE FOR COLLECTING AND REMOVING DOG DROPPINGS OR THE LIKE

Per Kjaer, Nedre Skogvei 4B, Oslo 2, Norway

Filed Oct. 10, 1979, Ser. No. 83,549
Claims priority, application Norway, Oct. 10, 1978, 783418
Int. Cl.³ A01K *29/00*
U.S. Cl. 294—1 B **9 Claims**



1. A device for collecting and removing dog droppings or the like, comprising:

a pair of gripping members for facilitating the lifting and gathering of said droppings or the like which members are hingedly connected to each other by a hinge connection and able to be moved towards each other at free ends of the gripping members remote from said hinge connection,

a bag of flexible material having an open end with a mouth portion, said bag in its operational position being located in the space between said gripping members and with its open end folded with its mouth portion about said free ends of the gripping members, and

a holding means arranged between said gripping members at a distance from the free ends thereof and arranged to receive a number of said bags, so that the bags may successively be extracted from said holding means for disposition in said operational position.

4,273,371

CLAW HOOK ASSEMBLY

Edward R. Behnke, Lockport, and Floyd W. Sanderson, Grand Island, both of N.Y., assignors to Columbus McKinnon Corporation, Tonawanda, N.Y.

Filed Jun. 20, 1979, Ser. No. 50,180
Int. Cl.³ B66C *1/34*; F16G *15/04*
U.S. Cl. 294—78 R **7 Claims**

1. In an articulated load bearing connecting device adapted to engage at each of its opposite ends a link of an interconnecting link type load chain, the improvement which comprises in combination:

a. a first chain grappling member having a first open end adapted to removably engage a load chain and a second end having an eye;

b. a second chain grappling member having a first open end adapted to removably engage a load chain and a second

end formed in a bifurcated clevis adapted to receive said second end of said first chain grappling member between the opposite portions of said bifurcated clevis, said clevis including a laterally extending passage through each opposite portion of said bifurcated clevis whereby said passage and said eye may be brought into axial alignment; and

c. a load pin extending through said laterally extending passage and said eye to interconnect said first and second chain grappling members in an articulated joint.

4,273,372

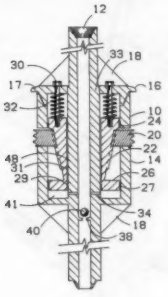
APPARATUS FOR USE IN LOWERING CASING STRINGS

Adel A. Sheshtawy, Norman, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation of Ser. No. 942,243, Sep. 14, 1978, abandoned. This application Dec. 10, 1979, Ser. No. 101,603

Int. Cl.³ E21B *31/20*

U.S. Cl. 294—86.15 **7 Claims**



7. A quick release running tool for offshore operations comprising:

a hollow housing having radial openings in the walls thereof;

a hollow guidepost running through said housing and forming an annulus between the exterior of the post and the interior of the housing;

segmented elements fitted radially in said openings;

means connected to said segmented elements to radially extend or retract said elements beyond or within the outer wall of said housing responsive to fluid pressure within said hollow guidepost;

the exterior end of each element having threads thereon aligned with the threads on the other exterior ends forming a discontinuous screw thread to enable release of said elements by rotation of the tool in event said means fail to retract said elements.

4,273,373

HOIST CLAMP

Martinus B. van de Wetering, Zeist, Netherlands, assignor to Interproduct B.V., Driebergen, Netherlands

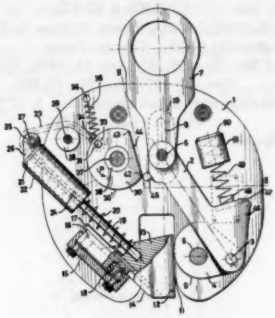
Filed Jun. 4, 1979, Ser. No. 44,972

Claims priority, application Netherlands, Jun. 8, 1978, 7806250

Int. Cl.³ B66C *1/48*

U.S. Cl. 294—101 **8 Claims**

1. An improved hoist clamp for clampingly gripping plate-shaped pieces, comprising an eccentric round clamping segment constituting one lever of a spring operated toggle lever system on which at the other end the hoisting eye operates, said segment co-operating with a counter clamping segment as is part of a movable wedge and a locking system associated with said wedge; said improvement comprises: having said wedge co-operating with a stationary block, and being connected, by means of a flexible connection, with said locking system.



4,273,374

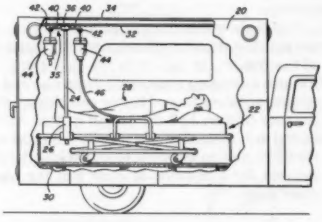
ANCHORING DEVICE FOR INTRAVENOUS BOTTLE HOLDER

Stanley J. Portman, 185 Essex St., Melrose, Mass. 02176

Filed Jan. 3, 1979, Ser. No. 787

Int. Cl.³ A61G *3/00*

U.S. Cl. 296—19 **8 Claims**



1. An emergency vehicle means comprising:

a support platform;

a roof in fixed relation with said support platform;

patient support means disposed on said support platform;

a support pole secured to said patient support means and projecting upwardly therefrom, said support pole having an upper distal end projecting upwardly away from said patient support means towards said roof;

bottle holder means attached near said upper distal end of said support pole and having a pair of oppositely extending radial arms, each of said arms having a loop formed at the outward distal end thereof for holding one or more dependingly attached bottles; and

anchoring means for removably attaching said support pole to said roof, for reducing swaying movement of said support pole and said bottle holder means and for substantially preventing rotation of said bottle holder means, said anchoring means comprising a disc-shaped plate having a central recess for receiving said upper distal end of said support pole, sad disc-shaped plate having a pair of mounting holes for fixed mounting thereof to an interior surface of said roof and a diametric slot for receiving said oppositely extending radial arms of said bottle holder means.

4,273,375

DEVICE FOR PREVENTING AIR-CONDITIONING WARM OR COOL BLAST FROM BLOWING THROUGH UNDER A SEAT

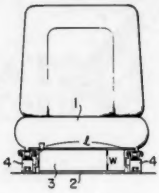
Fumiaki Kobayashi, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Division of Ser. No. 895,385, Apr. 11, 1978. This application Nov. 30, 1979, Ser. No. 98,888

Claims priority, application Japan, Dec. 1, 1977, 52/161363

Int. Cl.³ B62D *27/04*

U.S. Cl. 296—65 R **17 Claims**



1. In a vehicle having a floor and a seat, spaced above the floor, which is adjustably slidable forwardly and rearwardly on tracks, the improvement comprising a shield for blocking the flow of cooling or heating air from locations forward of the seat beneath the seat between it and the floor to a region to the rear of the seat, said shield comprising:

a one-piece substantially imperforate plate, U-shaped in plan, having upper and lower horizontal edges, said lower edge being fixedly secured to the floor, said plate having a width, throughout substantially its entire extent, substantially equal to the spacing of the seat from the floor and extending vertically therebetween, said U-shaped plate including:

a central bight section, adjacent to and below the front of the seat, having a length substantially equal to the width of the seat,

a first arm extending rearwardly from one end of the bight section adjacent to and below one side of the seat for a distance of over half the length of that one side, and

a second arm extending rearwardly from the other end of the bight section adjacent to and below the other side of the seat for a distance of over half the length of that other side.

4,273,376

CONVERTIBLE SEAT STRUCTURES FOR AUTOMOBILE VEHICLES

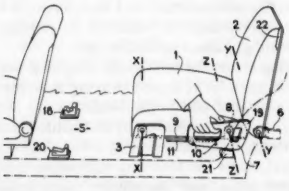
Pierre Duguet, Feucherolles, and Christian Robert, Rueil Malmaison, both of France, assignors to Automobiles Peugeot and Societe Anonyme Automobiles Citroen, both of Paris, France

Filed Dec. 28, 1979, Ser. No. 108,001

Claims priority, application France, Jan. 29, 1979, 79 02206

Int. Cl.³ B60N *1/02*

U.S. Cl. 296—65 R **8 Claims**



1. A convertible seat structure, in particular for an automobile vehicle, the seat structure being convertible from a normal position of use to a utility position for increasing loading space and comprising a seat mounted to be pivotable through substantially 180° about a transverse axis located in the vicinity of a front part of the seat, a backrest which is capable of being swung over forwardly through substantially 90° about a transverse axis located adjacent a lower part of the backrest, a mechanism comprising an actuating handle located on at least one side of the seat structure and mounted on the seat to pivot about a transverse axis, and a protecting panel which is disposed flat under the seat in said normal position of use and is raisable so as to be roughly perpendicular to the seat in said utility position, the panel being associated with the handle for being shifted by the handle, and the handle defining a support surface for the seat in said utility position.

4,273,377

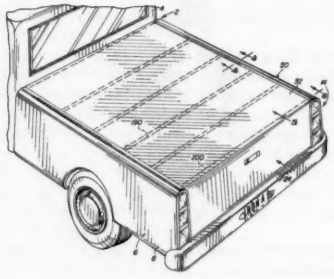
TONNEAU COVER APPARATUS FOR PICKUP TRUCK VEHICLES

Ronald R. Alexander, 5301 W. Saguaro, Glendale, Ariz. 85304

Filed Apr. 9, 1979, Ser. No. 28,218

Int. Cl.³ B60P *7/02*

U.S. Cl. 296—100 **14 Claims**



1. In a pickup truck having a cab, a bed extending rearwardly from the cab, two sides extending upwardly from the bed, and a tailgate remote from the cab, tonneau cover apparatus extending between the sides and from the cab to the tailgate, for covering the bed, comprising, in combination:

track means secured to the sides of the pickup truck;

bearing means disposed in the track means and movable therein;

bracket means secured to the bearing means and movable therewith in the track means, and including

plate means,

a slot extending through the plate means,

fastening means extending through the slot and secured to the bearing means for securing the bracket means to the bearing means for moving the bracket means and the bearing means in the track means and movable in the slot for providing axial, lateral, and vertical movement of the plate means of the bracket means relative to the bearing means; and

cover means secured to the plate means and movable with the bracket means and the bearing means for selectively covering and uncovering the bed of the pickup truck.

4,273,378

VEHICLE DOOR, ESPECIALLY FOR A DRIVER'S CAB

Peter Kramer, Spich, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Jul. 24, 1978, Ser. No. 927,297

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1977, 2733166

Int. Cl.³ B60J *5/04*

U.S. Cl. 296—146 **9 Claims**

1. A vehicle door for an operator cab of a vehicle used for

agricultural and construction purposes which is composed of elements rigidly attached to each other to form a unitary frame structure which includes an outer frame section, and an inner frame section fixed to said outer frame section, at least one of said frame sections being provided with web means having surfaces bracing said inner and outer frame sections with regard to each other in transversly of said inner and outer frame sections, a portion of said web means of one of said frame sections being provided with bracing surfaces engaging oppositely located bracing surfaces of the other one of said two frame sections, said inner and outer frame sections both being of glass fiber reinforced synthetic material, the bracing surfaces of said web means extending transversly of an adjacent portion of the adjoining web means, each frame section comprising an upright front arm and rear arm and also an upper arm and lower transverse arm interconnecting said upright arms, for absorbing transverse and diagonal forces therebetween, the bracing surfaces of said web means being located within the region of one of said upper and lower transverse

arms, the bracing surfaces being firmly connected to one of said transverse arms, said web means having conical guiding surfaces, the conical guiding surfaces of the web means belonging with one of said frame sections having those ends of said web means which are adjacent the other frame section provided with flange means for bracing engagement with said other frame section, said web means having a U-shaped cross section and legs of said U-shaped cross section comprising said conical guiding surfaces, reinforcing means between the legs of said web means for receiving tightening screws therein, at least two of said web means having a U-shaped cross section and having hinge holding means between the legs thereof for receiving hinge means for said vehicle door, said inner frame section being provided with first web means of U-shaped cross section, and the outer frame section being provided with second web means of U-shaped cross section, the legs of said first and second web means being in bracing engagement with each other, said hinge holding means being provided between the legs of said second web means and being fastened thereto with transfer of support forces of hinge means therewith.

4,273,379

COLLAPSIBLE CHAIR

Donald J. Borichevsky, Wells, Vt., assignor to The Telescope Folding Furniture Co., Inc., Granville, N.Y.

Filed Sep. 5, 1979, Ser. No. 72,160
Int. Cl.³ A47C *4/32*
U.S. Cl. 297—56 **8 Claims**

1. A collapsible chair comprising a pair of frames disposed in spaced parallel relation, each frame having a pair of legs disposed in hinged crossing relation to each other to permit movement of said legs between a closed over-lapping position and an opened position relative to each other, one of said legs of each said pair of legs extending upwardly to a higher plane than the other leg of said pair of legs in said opened position;

a plurality of cross-bars interconnecting said frames together, said cross-bars including a front cross-bar secured to an upper end of each said other leg, an intermediate cross-bar secured to intermediate portions of each said one leg, and a rear cross-bar secured to an upper end of each said one leg;

a strip of material secured to and over said front, intermediate and rear cross-bars; and

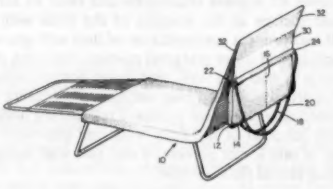
a pair of struts, each strut being hinged to said upper end of a respective said other leg and releaseably secured to said upper end of a respective one leg biasing said legs apart and imparting a pre-stress to said material in said opened position.

4,273,380

BEACH ACCESSORY

Margaret W. Silvestri, 18 Arbor Ct., Peabody, Mass. 01960

Filed Aug. 27, 1979, Ser. No. 70,302
Int. Cl.³ A47C *31/10*
U.S. Cl. 297—191 **5 Claims**

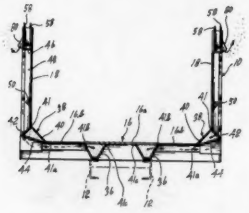


1. A beach accessory in the form of a combined beach towel—chair cover—tote bag, comprising an elongated strip of absorbent towelling having substantially superimposed pockets on its opposite major surfaces at one end, at least one of said pockets being large enough to store the entire length of towelling not covered by the pockets, said pockets opening inwardly of the towelling and having stringing through casings along their free edges to allow closure thereof to form a tote bag for said towelling and other articles to be carried, said free edges, when said stringings therein are not under tension, running perpendicular to the longitudinal axis of said towelling and being of substantially the same length as the width of said towelling adjacent said free edges, said accessory further comprising tucks in said towelling near said pockets, said tucks defining the corners of a fold adapted to fit said accessory to the back of a chair or chaise lounge, while allowing said pockets to hang from said back to provide storage, said tucks being short enough and said fold being narrow enough to allow said accessory to be placed substantially flat on a flat surface.

4,273,381
DUMP BODY FOR MOUNTING ON THE FRAME OF A VEHICLE

Jean-Marie Bibeau, 109 Houle Blvd., St. Gabriel de Brandon, and Marcel Bibeau, 4471, Castel d'Autray, St. Felix de Valois, both of Canada

Filed Oct. 27, 1978, Ser. No. 955,386
Int. Cl.³ B60P 1/00
U.S. Cl. 298—1 H **1 Claim**



1. A dump body for mounting on the frame of a truck comprising:

(a) a floor, side walls and a front wall secured together to form an integral unit;

(b) a rear gate closing the back of the unit; and

(c) wherein the floor comprises an elongated central plate forming a central, flat floor section, and a pair of elongated lateral plates, each of smaller thickness than said central plate, each lateral plate forming a lateral floor section co-planar with said central floor section and the inner marginal portion of each lateral plate adjacent said central plate being overlapped by said central plate and bent to form a generally V-shaped longitudinally-extending beam having the edges of its legs welded to the underside of said central plate, each of said beams resting directly on the frame of the truck to fully support the dump body, each lateral plate having an outer marginal portion which has its free edge welded to a respective side wall, said outer marginal portion inclined upwardly at an angle of about 45 degrees relative to said floor to form an inclined surface at the junction of the floor with the side wall and prevent accumulation of dust and gravel at said junction, said outer marginal portion overlying the lower portion of said side wall, said lower portion bent to form two mutually-inclined plate sections constituting with said inclined outer marginal portion a reinforcing hollow beam at the junction of the floor with one side wall, the free edge of said lower portion of said side wall being welded to said lateral floor section.

4,273,382
BODYGUIDE AND HOLDDOWN SYSTEM USABLE WITH DUMP TRUCKS AND TRAILERS

Robert W. Benson, Rte. 4, Box 338, Parkersburg, Wood County, W. Va. 26101

Filed Jul. 19, 1979, Ser. No. 58,836
Int. Cl.³ B60P 1/28
U.S. Cl. 298—38 **10 Claims**

1. A bodyguide and holddown system for use with a dump body mounted on a vehicle, said system having first and second complementary components that interact with each other to center the dump body on a chassis of the vehicle, releaseably hold the dump body on the chassis, and oppose lateral movement of the dump body with respect to the chassis;

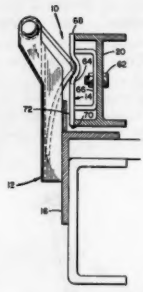
said first complementary component being affixable to one of the dump body and the chassis and comprising:

a generally U-shaped member having a portion thereof affixable to one of the dump body and the chassis and openings formed in upper portions thereof for receiving a bolt;

a bolt extending through said openings and connected to said U-shaped member; and

a spring member connected to said U-shaped member by said bolt and having a horizontally extending portion thereof forming an engagement surface; and

said second complementary component being affixable to the other of the dump body and the chassis and comprising a generally vertically extending member having a horizontally extending shaped portion formed therein;

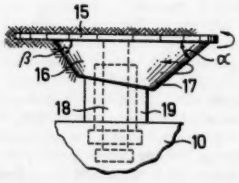


said first and said second complementary components being affixable to the dump body and the chassis in such manner that contact between said spring member and said vertically extending member during movement of the dump body towards the chassis tends to center the dump body on the chassis and engagement between said engagement surface and said horizontally extending shaped portion releasably holds the dump body on the chassis.

4,273,383
MINERAL WINNING MACHINES

Hans-Theodor Grisebach, Unna, Fed. Rep. of Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Mar. 2, 1979, Ser. No. 16,745
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1978, 2809132
Int. Cl.³ E21C 27/00
U.S. Cl. 299—23 **10 Claims**



1. A mineral winning machine guided for movement back and forth alongside a mineral face and equipped with a plurality of separate cutting devices which are staggered and serve to cut into the mineral face to different depths as the machine progresses along the mineral face, wherein: each cutting device is composed of rotary cutting means for initially cutting into the mineral face and rotary wedging means for detaching mineral in a wedging action after the initial cutting operation performed by the associated cutting means, the cutting means and the wedging means of each device being rotatable about a common axis and, wherein drive means is provided for driving the cutting means and the wedging means of each device

separately and individually with the cutting means being driven at a higher rotational speed than the wedging means.

4,273,384

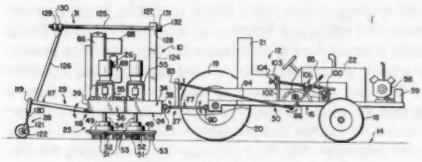
VEHICLE-TOWED ROADWAY GRINDING MACHINE

Lewis R. Freeburn, 1030 Clarendon Rd., Quincy, Mich. 49082

Filed Oct. 17, 1979, Ser. No. 85,474

Int. Cl.³ E01C *23/09*

U.S. Cl. 299—41 **9 Claims**



1. An adjustable grinding machine towed by a vehicle for grinding a surface traversed by the vehicle, the combination comprising:

a support member having a front portion and a rear portion;

a plurality of grinding members, each grinding member having a grinding surface;

means for rotatably mounting said grinding members to said support member in a downwardly extending orientation wherein all of said grinding surfaces are substantially contained in a single plane;

power means, coupled to said grinding members, for rotating said grinding members;

first coupling means for hingedly coupling said support member front portion to the vehicle above the surface to be ground;

wheel means for supporting said support member rear portion above the surface to be ground;

second coupling means for hingedly coupling said wheel means to said support member rear portion;

first adjusting means, coupled to said first coupling means, for adjusting said first coupling means to vary the elevation of said front portion relative to the surface to be ground; and

second adjusting means, coupled to said second coupling means, for adjusting said second coupling means to vary the elevation of said rear portion relative to the surface to be ground,

thereby controlling said support member to present the single plane containing said grinding surfaces parallel to and in even contact with the surface to be ground,

said first coupling means comprising

an elongated member having first and second ends,

means for hingedly coupling said elongated member first end to the vehicle about an axis parallel to the ground, and

means for hingedly coupling said elongated member second end to said support member front portion.

4,273,385

DEVICE FOR SAFETY GUIDING OF HAULING CHAIN ESPECIALLY AT RANGING DRUM SHEARER IN COAL MINING

Jan Rynik, Gliwice, Poland, assignor to Politechnika Slaska im. Wincentego Pstrowskiego, Gliwice, Poland

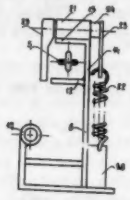
Filed Jul. 25, 1979, Ser. No. 60,426

Claims priority, application Poland, Jul. 24, 1978, 208629; Dec. 5, 1978, 211507; Mar. 2, 1979, 213841

Int. Cl.³ E21C *35/04, 29/20*

U.S. Cl. 299—42 **10 Claims**

1. A device for safety guiding a hauling chain, adapted for a ranging drum shearer in a coal mining apparatus equipped with chain haulage drive means comprising means for screening the hauling chain along a guard rail assembly adjacent a conveyor, and chain guide means having screening plates are fixed to the ranging drum shearer, wherein said guide means are mounted



for translation movements along the route of the conveyor inside the screening means of said guard assembly.

4,273,386

CONTROL VALVE ASSEMBLIES

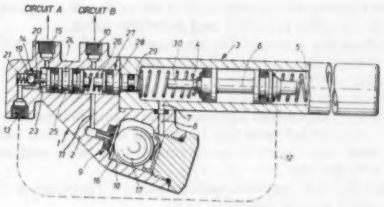
Glyn P. R. Farr, Warwich, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Dec. 28, 1979, Ser. No. 107,826

Claims priority, application United Kingdom, Jan. 22, 1979, 02229/79

Int. Cl.³ B60T *8/26*

U.S. Cl. 303—6 C **10 Claims**



10. A master cylinder and a control valve assembly for a vehicle braking system having first and second circuits, said master cylinder being fast with said assembly, said control valve assembly comprising a first inlet and a first outlet for connection in said first circuit, a first, inertia-responsive control valve for controlling communication between said first inlet and outlet, a second inlet and a second outlet for connection in said second circuit, a second control valve operable in response to pressure prevailing in said first circuit to control the flow by pressurized fluid between said second inlet and outlet, equalizing means for ensuring equalization of the pressures at said outlets in normal operation, said equalization means comprising bore extending between said first and second outlets, and a free floating piston working in said bore and being movable to open and close said second control valve, a differential-area piston arrangement co-operating with said free-floating piston, a larger area portion of said differential-area piston arrangement being subjected to the pressure at said first outlet and a smaller area portion being subjected to the pressure at said first inlet, said master cylinder having a piston defining a pressure chamber, said smaller area portion of said piston arrangement extending into said pressure chamber and being engageable by said piston of the master cylinder, in the event of pressure failure in said first circuit, to urge said piston arrangement into engagement with said floating piston, and thereby hold said second control valve open.

4,273,387
HYDRAULIC BRAKE SYSTEM

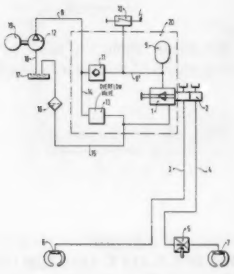
Gerald Höfer, Weissach-Flacht; Ewald Hübl, Schwieberdingen, and Steffen Schneider, Möglingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 9, 1979, Ser. No. 65,303

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1978, 2848216

Int. Cl.³ B60T *13/14*

U.S. Cl. 303—10 **9 Claims**



1. A hydraulic brake system including:
a fluid storage tank;
a pump connected with said tank and continuously operated during vehicle operation for supplying fluid under pressure in said brake system;
an overflow valve having a predetermined closing force;
a first pressure line connected at one end with said pump and at the other end with said overflow valve;
a return line connected to said overflow valve and said fluid storage tank to return fluid to said fluid storage tank from said overflow valve;
a second pressure line;
said second pressure line connected to said first pressure line at a point between said pump and said overflow valve;
at least one reservoir in communication with said second pressure line;
whereby said reservoir operates under the pressure predetermined by said overflow valve.

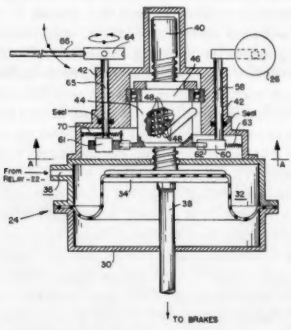
4,273,388
AIR BRAKE SAFETY MECHANISM

Zdenek Muller, 2032 Kingsford, Sydney, New South Wales, Australia

Filed Jul. 13, 1979, Ser. No. 57,274

Int. Cl.³ B60T *17/16*; 303 *89*

U.S. Cl. 303—89 **7 Claims**



1. A fluid operated braking mechanism for a vehicle, comprising: a brake chamber; a movable member mounted in said brake chamber and responsive to fluid pressure introduced into said chamber for operating the brakes of the vehicle; a housing mounted adjacent to said brake chamber; and elongated screw affixed to said movable member in said brake chamber and extending into said housing for linear movement in both directions along a particular axis, said movable member holding said elongated screw against rotation; a nut positioned in coaxial relationship with said screw and in threaded relationship with said screw to permit such linear movement of said screw along said axis so long as said nut is freely rotatable; bearing means mounting said nut in said housing to cause said nut to be freely rotatable, said nut having an annular ratchet extending around its periphery; a latch mounted in said housing; and operator means for said latch for causing said latch to move from a disengaged position to a second position in which it engages said ratchet on the nut and prevents rotation of the nut in one direction only when the fluid pressure for the braking mechanism drops below a predetermined threshold.

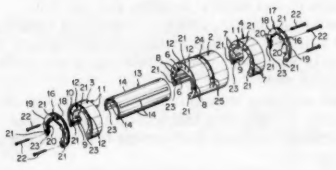
4,273,389
BALL SPLINE BEARING ASSEMBLY

Takamoto Takai, Tokyo, Japan, assignor to Nippon Thompson, Co., Ltd., Tokyo, Japan

Filed Oct. 24, 1979, Ser. No. 87,788

Int. Cl.³ F16C *31/06*

U.S. Cl. 308—6 C **6 Claims**

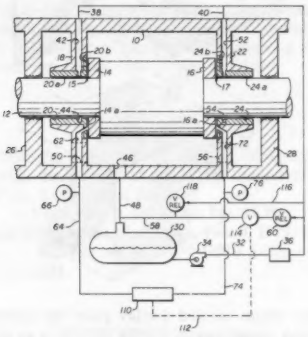


1. A ball spline bearing assembly comprising:
an outer ring having a plurality of axially extending non-load ball raceways formed internally thereof and having a plurality of axially extending load raceways of generally semicircular cross section formed in its radially inner surface;
a shaft fitted axially and slidably within said outer ring, said shaft having a plurality of axially extending load raceways of generally semicircular cross section formed in its radially outer surface;
a plurality of balls contained in said raceways;
a ball cage coaxially disposed between the radially inner surface of said outer ring and the radially outer surface of said shaft, said ball cage, having a plurality of axially extending ball slots of substantially uniform cross section for retaining balls disposed in the load raceways formed in part by said outer ring and in part by said shaft; and
a pair of guide plates located one each at the axial ends of said outer ring, said guide plates being provided with a plurality of channels cooperating one each with the axial end of one of said load raceways and the axial end of one of said non-load raceways, said guide plates including means to secure said ball cage in both axial and rotational alignment with said outer ring.

4,273,390
BEARING SYSTEM WITH THRUST COMPENSATION MEANS

Judson S. Swearingen, and Michael D. Irvine, both of Los Angeles, Calif., assignors to Rotoflow Corporation, Los Angeles, Calif.

Filed May 15, 1978, Ser. No. 905,649
Int. Cl.³ F16C *1/24*
U.S. Cl. 308—168 **10 Claims**

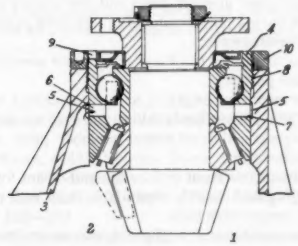


1. A thrust bearing system comprising:
a thrust bearing structure including at least a first pair of opposed bearing faces defining a first bearing space therebetween;
means for delivering lubricant to said first bearing space;
thrust compensation means operative upon delivery thereto of an activating signal to increase the pressure with which the lubricant is delivered to said first bearing space;
and load sensing means including switch means associated with said bearing structure for determining the value of a parameter indicative of the thrust load on said first pair of bearing faces and operatively associated with said thrust compensation means to deliver said activating signal to said thrust compensation means substantially instantaneously when said parameter exceeds a predetermined limit.

4,273,391
DEVICE FOR AXIAL ADJUSTMENT OF A ROTATABLE BODY

Sture L. Asberg, Partille, Sweden, assignor to SKF Nova AB, Gothenburg, Sweden

Continuation of Ser. No. 855,758, Nov. 29, 1977, abandoned.
This application Aug. 10, 1979, Ser. No. 65,621
Claims priority, application Sweden, Dec. 1, 1976, 7613437
Int. Cl.³ F16C *25/06*
U.S. Cl. 308—174 **1 Claim**

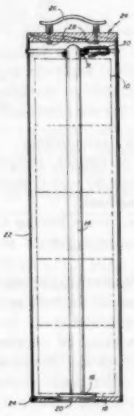


1. The combination comprising a housing, a shaft journal having a gear wheel at one end, a bearing assembly rotatably supporting the shaft journal in a cylindrical seat in said housing including a one-piece outer ring having threads on its outer periphery cooperating with threads in said cylindrical seat, means defining a plurality of circumferentially spaced openings in the outer axial end face of the outer ring to accommodate a turning tool having projections corresponding to the openings thereby to permit axial adjusting movement of said bearing assembly relative to said housing, an inner race ring on said shaft journal, two rows of rolling bodies in the annular space between said rings spaced closely relative to one another, one of said rows comprising rollers having axes inclined at an angle to the bearing axis disposed adjacent said gear wheel, the other row of rolling bodies comprising balls which roll against raceways in the rings to provide angular contact disposed at the opposite end of said shaft journal.

4,273,392
TISSUE ROLL HOLDER

Constance E. Stinson, 33 Franklin Ave., Quincy, Mass. 02170

Filed May 4, 1979, Ser. No. 35,940
Int. Cl.³ A47F *3/02*; B65D *85/672*
U.S. Cl. 312—42 **1 Claim**



1. A tissue roll holder for holding a plurality of tissue rolls comprising;
an elongated support rod receiving the open core of the rolls and including means permitting the rolls to be vertically stacked one on top of the next with all rolls being supported stationary on the support member but being removable by lifting from the support member,
said support rod having a support plate at the bottom thereof having the lowermost roll supported thereon with the plate disposed orthogonally to the support rod and having a diameter greater than the tissue roll core inner diameter,
an elongated cylindrical housing having a closed base permitting the housing to be free-standing in a vertical position, the inner diameter of the housing being greater than the maximum diameter of a tissue roll so that the stacked vertical array of rolls readily is accommodated in the elongated housing,
said housing base forming a support for the support member plate thus elevating the bottom roll above the closed base by at least the thickness of the plate,
means at the top of the elongated support member for allowing removal of the tissue roll array, in toto, said latter means comprising means adapted to be grasped and disposed at the very top end of the support rod, said manually graspable means being dimensioned to permit removal of the rolls one at a time therepast,
and a top removable cover for closing the housing, said

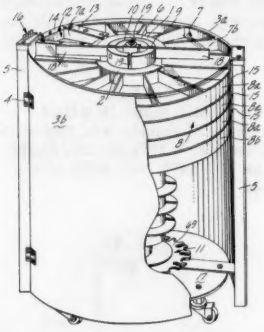
tissue rolls being supported primarily only on their base absent any side support.

4,273,393

AUTOMATIC COMPONENT DISPENSOR

Michael S. Foley, Beverly, and Mark V. Pierson, Lynn, both of Mass., assignors to USM Corporation, Farmington, Conn.

Filed Sep. 20, 1979, Ser. No. 76,975
Int. Cl.[3] A47F *5/02*; H05K *13/04*
U.S. Cl. 312—97.1 **9 Claims**



1. A dispensing device comprising:

at least two banks of flanges, flanges of one bank being arranged to reciprocate into coplanar relationships with flanges of the other bank;

a plurality of stacked trays having compartments formed therein, slidably disposed upon and supported by said flanges;

means to index simultaneously the top tray supported on the one bank of flanges and the bottom tray supported on the other bank of flanges; and

means to restrain indexing of intermediate trays disposed below said top tray on said one bank and above said bottom tray on said other bank whereby said intermediate trays will index from one bank to the other bank.

4,273,394

APPARATUS FOR SUPPORTINGLY ORGANIZING AND DISPLAYING MISCELLANEOUS ARTICLES

Earl E. Chandler, P.O. Box 1624, Coolidge, Ariz. 85228

Continuation-in-part of Ser. No. 937,543, Aug. 28, 1978, Pat. No. 4,225,202. This application Feb. 21, 1980, Ser. No. 123,387
Int. Cl.[3] A47B *63/00*; A47F *5/08*; A47B *96/06*
U.S. Cl. 312—184 **11 Claims**

1. An apparatus for supportingly displaying miscellaneous articles in organized arrays comprising:

(a) a box including,

I. a base having a floor with an upstanding end wall,

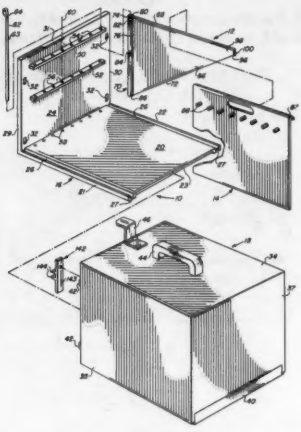
II. a cover having a top from which an opposed pair of sidewalls and an end wall depend, and

III. means on said base and on said cover for demountably coupling said cover to said base;

(b) at least one cantilever arm means of generally triangular configuration having an elongated horizontal top edge and an elongated vertical side edge;

(c) means adjacent the upper end of the upstanding end wall and in the floor of said base and on said cantilever arm means for demountably and pivotably mounting said cantilever arm in said box so that its elongated vertical side edge lies along a vertical axis adjacent the upstanding end wall of said base and said cantilever arm means is pivotably movable about that vertical axis;

(d) a display panel demountably suspended from said cantilever arm means; and



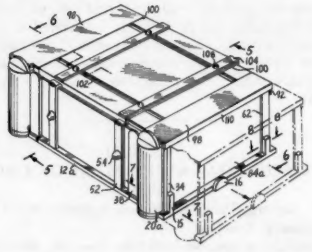
(e) fastener means on said display panel for demountably supporting miscellaneous articles thereon in an organized array.

4,273,395

ADJUSTABLE BOX

John Martinez, and Lilla V. Britt, both of 1646 East 2nd St., Brooklyn, N.Y. 11230

Filed Jul. 18, 1979, Ser. No. 58,494
Int. Cl.[3] A47B *45/00*
U.S. Cl. 312—205 **9 Claims**



1. A slidably adjustable, readily assemblable box comprising:

a slidably expandable base portion;

front corner member posts and rear corner member posts, said front corner member posts and rear corner member posts each having portions defining relatively perpendicular slots therebetween;

means for securing said front and rear corner member posts to said base portion;

front corner members engaging said front corner member posts in their perpendicular slots, and rear corner members engaging said rear corner member posts in their perpendicular slots;

a slidably expandable front wall panel, and means for pivotally engaging said slidably expandable front wall panel to said front corner members;

a slidably expandable rear wall panel, and means for engaging said rear wall panel to said rear corner members;

side wall members, and means for engaging said side wall members to said front and rear corner members;

said front wall panel and said rear wall panel having a slid-

able length relatively equal to a slidable length of said base portion;

said means for engaging said side walls of the box to said front and rear corner members including complimentary engaging slot portions on a side edge portion of said front corner members and on a side edge portion of said rear corner members, said slot portions snugly engaging vertical edges of said side walls; and

transverse slots being provided on cover portions of said corner members, said transverse slots engaging downwardly projecting lip portions provided on said side wall members, and descending lip portions provided on rear edges of said side walls, and snugly abutting against rear wall sections of said rear corner members.

4,273,396

DISPLAY UNIT

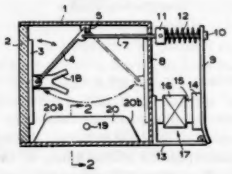
Takeshi Teragaki; Yasuya Ohno, both of Tokyo, and Etsuso Yokoyama, Tachikawa, all of Japan, assignors to T.I.C. - Citizen Co., Ltd., Tokyo, Japan

Filed May 9, 1979, Ser. No. 37,282

Claims priority, application Japan, Feb. 9, 1979, 54-16445[U]

Int. Cl.[3] **A47B** *77/08;* **G08B** *5/22*

U.S. Cl. 312—223 **10 Claims**



1. A magnetically operated display unit for use in displaying characters or figures at two stable positions comprising:

a hermetically sealed casing having a transparent front wall;

a reflector plate which is movable between a display position at which said reflector plate is disposed in the proximity to or in contact with the inner surface of said front wall and a non-display position apart from said display position inside said casing; and

driving means for moving said reflector plate in such a manner that said reflector plate is rotated about a first pivot located on a plane in parallel with the front surface of said reflector plate while said reflector plate moves between said display position and said non-display position, and that said first pivot undergoes displacement with respect to said plane, said driving means further comprising a lever which is connected at its one end to said reflector plate so as to rotate about said pivot and is connected at its other end to said casing so as to rotate about a second pivot in parallel with said first pivot, lever drive means for driving said lever about said second pivot over a predetermined range, and control means for controlling the direction of said reflector plate in the course of the rotation of said lever.

4,273,397

FILING CASE HAVING REMOVABLE, EXPANDING FILE

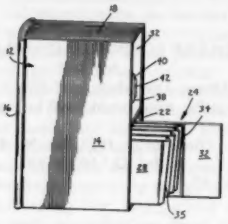
Lily P. Nolan, 4248 D'youville Trace, Atlanta, Ga. 30341

Filed Sep. 10, 1979, Ser. No. 74,057

Int. Cl.[3] **A47B** *83/00, 63/00;* **B65D** *27/08*

U.S. Cl. 312—237 **3 Claims**

1. In a filing case which may be manufactured to simulate a book: a case having a hollow interior defined by opposed sides, opposed ends and having one closed edge thereof which may simulate the spline of a book and the other edge thereof spaced from said closed edge having an opening to provide access to the hollow interior compartment; an expanding envelope inserted within said case for removal through said open edge spaced from said spline, said expanding envelope comprising a plurality of individual compartments connected by gussets between opposed edges which may be moved toward or away from one another by expanding or contracting said envelope, whereby said expanding envelope may be removed from said case for the storage of photographs, coupons, or the like within said individual compartments and then compressed and returned to said case to be concealed therein from view when



said case is placed on a shelf or the like, and a movable panel attached to and coextensive with one opposed edge and the gusset on said expanding envelope which movable panel may be moved out of the way from in front of the gussets when said envelope is removed from said case and is moved into position over said expanding envelope to conceal the gussets therein when said envelope is positioned within said case, said panel thereby becoming the front closure on said case to close the opening and conceal the envelope therein.

4,273,398

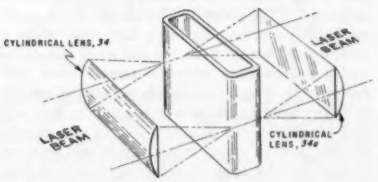
METHOD AND APPARATUS FOR MANUFACTURING GAS-FILLED TUBES AND THE LIKE

Tommy L. Summers, and David L. Yenawine, both of Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 13, 1978, Ser. No. 877,450

Int. Cl.[3] **H01J** *9/38, 9/40*

U.S. Cl. 316—20 **48 Claims**



20. A method of manufacturing radioactive gas-filled light sources for illuminating displays and the like comprising the steps of:

(a) coating the interior surface of a glass tube with a phosphor material;

(b) sealing one end of said glass tube;

(c) mounting said glass tube in a pressure chamber;

(d) maintaining said pressure chamber at a first predetermined pressure;

(e) filling said glass tube with a radioactive gas via the unsealed end thereof, said radioactive gas for generating energy to excite said phosphor material and thereby produce light energy;

(f) maintaining said radioactive gas in said glass tube at a constant second predetermined pressure whereby each gas-filled light source contains said radioactive gas at said predetermined pressure;

(g) indexing said glass tube in increments of a predetermined length;

(h) focusing a laser beam through a cylindrical lens to provide a relatively long and narrow beam of light energy simultaneously across the entire width of said glass tube at each indexed position to thereby seal and sever said tube along said beam, the length of said beam being at least equal to the width of said tube; and

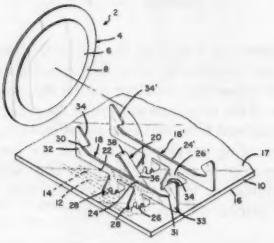
(i) removing gas-filled segments of said predetermined length from said pressure chamber.

4,273,399

TRANSDUCER SUPPORTING AND CONTACTING MEANS

Ronald W. Myers, Landisburg, and Daniel V. Nardone, Camp Hill, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 5, 1979, Ser. No. 91,672
Int. Cl.³ H01R 9/09
U.S. Cl. 339—17 C **17 Claims**



1. A circuit board having supporting and contacting means thereon for supporting a circular disk-like piezoelectric tone transducer in spaced parallel relationship to said circuit board and for establishing first electrical contact with the periphery of said transducer and second electrical contact with a central location on said transducer, said supporting and contacting means comprising:

a pair of aligned sheet metal supporting members, said members being disposed in spaced-apart planes which extend normally of the plane of said circuit board, each of said supporting members having a first edge which is proximate to, and spaced from, the surface of said circuit board and a second edge which is remote from said circuit board, each of said members being secured to said circuit board by securing means which is remote from at least one end of said member whereby each of said members has a flexible portion which extends from said securing means to said one end, each of said flexible portions being laterally flexible normally of its own plane and parallel to the plane of said circuit board,

each of said members having on said second edge thereof opposed notches adjacent to the ends thereof, said notches being dimensioned to receive peripheral portions of said transducer, said notches constituting said first electrical contact,

said second electrical contact comprising a contact member having a mounting portion which is mounted on said circuit board between said supporting members, a spring contact arm extending from said mounting portion away from said circuit board, said contact arm having a contact portion

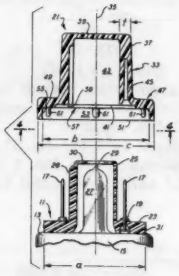
for establishing said second electrical contact whereby, said transducer can be mounted in said supporting and contacting means by flexing said flexible portions of said supporting members away from each other, positioning said transducer in said notches, and permitting said flexible portions to return to their normal positions, and said spring contact arm will be against, and in electrical contact with, said central location on said transducer.

4,273,400

PROTECTIVE MEANS FOR CRT BASE

Allan W. Porsch, Seneca Falls, and Fred L. Sorensen, Waterloo, both of N.Y., assignors to GTE Products Corporation, Stamford, Conn.

Filed Dec. 7, 1979, Ser. No. 101,387
Int. Cl.³ H01R 13/44
U.S. Cl. 339—36 **5 Claims**



1. Protective means for use on a CRT base seated on the closure header of the tube wherein a substantially annular array of tube connector pins protrude exteriorly from a circular flange-like member of the base structure through a plurality of aligned apertures therein surrounding a central hollow crown portion which encloses the sealed exhaust tubulation of the tube, said flange member having a circumferential sidewall and a diametrical dimension defining that of said base, said protective means being in the form of a one-piece cap-like structure comprising:

a central substantially cylindrical hollow body member having a longitudinal axis therethrough, and being formed of a curved sidewall portion having a closed terminal end and an opposed open proximal end thereby defining a central cavity proportioned to accommodate the crown portion of said base, said sidewall portion having sufficient thickness to have formed therein a plurality of longitudinal bores extending inwardly from said proximal end to effect spatial protective encompassment of said tube connector pins; a substantially planar outstanding rim-like basal portion formed about the open proximal end of said body member, said rim-like portion having alpha and beta surfaces and an external diameter greater than that of said base; a circular recess formed in said beta surface of said rim-like portion, said recess having a peripheral wall, a seating surface and a diameter slightly greater than that of said base to enable said basal portion recess to encompass a major portion of said base flange member when such is seated therein; and a plurality of spaced-apart retaining elements formed as nubbins are fashioned to protrude inward from the peripheral wall of said recess toward said axis, the protrusion of said nubbins being sufficient to effect adhering engagement with the circumferential sidewall of said base when said cap is positioned to encompassingly seat on said base.

4,273,401

ZERO INSERTION FORCE ELECTRICAL CONNECTOR

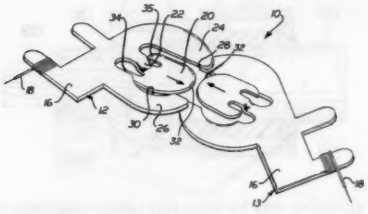
Leonard Katzin, 204 S. Swall Dr., Beverly Hills, Calif. 90211

Filed Jul. 6, 1979, Ser. No. 55,682
Int. Cl.³ H01R 4/58
U.S. Cl. 339—47 R **37 Claims**

1. A zero insertion force electrical connector comprising:

a pair of thin essentially planar elements engageable together

along a selected axis to an inserted position, and including an interior spreader member on a first element disposed when in the inserted position between opposed coplanar receiving arms on the second element, the spreader member lying in the same plane as the receiving arms and being pivotable relative thereto about an axis normal to the plane, the outside periphery of the spreader member engaging the interior and opposing receiving arms in edge



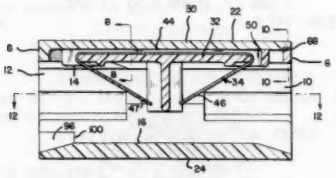
contact relation when pivoted relative thereto from the inserted position, and the second element being configured to provide spring force resistance against the action of the spreader member, whereby the two elements may be coupled together along the selected axis with minimum force and at least one may be pivoted relative to the other to an engaged position having at least two regions of edge contact maintained under pressure.

4,273,402

ELECTRICAL CONNECTOR RECEPTACLE

Donald W. K. Hughes, Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 16, 1979, Ser. No. 85,443
Int. Cl.³ H01R *13/424*
U.S. Cl. 339—91 R **11 Claims**



1. A double-ended receptacle of the general type comprising a housing assembly having oppositely directed first and second plug-receiving faces, a plug-receiving opening extending into each of said plug-receiving faces, each of said openings having opposed internal sidewalls and opposed internal endwalls, said housing assembly having opposed external sidewalls and opposed external endwalls, a plurality of parallel side-by-side conductors, each of said conductors having a first and second contact portion and an intermediate portion, said intermediate portion of each conductor being disposed in said housing assembly between one of said internal sidewalls and the one external side-wall which is adjacent to said one internal sidewall, each of said first and second contact portions emerging from said one internal sidewall at a location proximate to said first and second faces respectively and extending obliquely inward of its respective opening and towards the other internal sidewall, said receptacle being dimensioned to receive a connector plug in each of said first and second plug-receiving openings, said plugs having contact members therein which are engageable with said contact portions of said conductors, said receptacle being characterized in that:

said housing assembly comprises a housing frame and a tubular housing sheath, said housing frame being telescopically received in said housing sheath,

said housing frame comprises an elongated web which extends between said plug-receiving faces, said web having ends which are proximate to said faces, said web having first and second surfaces which extend between said ends, said first surface constituting said one internal sidewall, said second surface being proximate to internal surface portions of said sheath, a medial wall integral with, and extending from said first surface, said medial wall lying in a plane which is essentially perpendicular to said internal sidewalls and said internal endwalls, recesses in the sides of said medial wall, said first and second contact portions of said conductors having free end portions which are received in, and captured by, said recesses,

said intermediate portions of said conductors being between said second surface of said web and said internal surface portions of said sheath, said intermediate portions extending around said ends of said web, and

interengaging latching means on said frame and on said sheath, said latching means being spaced inwardly from said first plug-receiving face, said latching means being effective to prevent retrograde movement of said frame from its inserted position, whereby

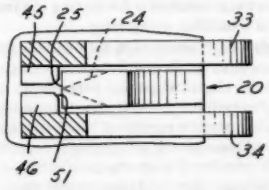
said housing frame is maintained in said tubular sheath in a predetermined position between said faces by said latching means.

4,273,403

LOCKING STRUCTURE FOR ELECTRICAL CONNECTORS

Thomas M. Cairns, Birmingham, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Feb. 1, 1980, Ser. No. 117,420
Int. Cl.³ H01R *13/627*
U.S. Cl. 339—91 R **6 Claims**



1. A pair of matable electrical connectors comprising:

a ramp member formed on a first of said pair of matable connectors having a generally fixed width with a flat lock surface generally perpendicular to the direction of movement to mate said pair of electrical connectors, and a prow like wedge positioned adjacent said flat lock surface and pointing away from a second of said pair of matable connectors;

a pair of cantilever beams formed on said second of said pair of matable connectors, supporting portions of each of said cantilever beams extending upwardly from a rear portion of a surface of said second connector with said cantilever beams projecting forwardly therefrom in a parallel, spaced relationship toward a front face of said first connector; the spacing between said cantilever beams being slightly greater than said generally fixed width of said ramp member; each of said cantilever beams having at its free end an enlarged portion which projects into the space between said cantilever beams towards, but not into engagement with, said enlarged portion on the other one of said cantilever beams whereby a space exists between said enlarged portions,

whereby said cantilever beams are deflected upwardly by engagement with said ramp member and said enlarged

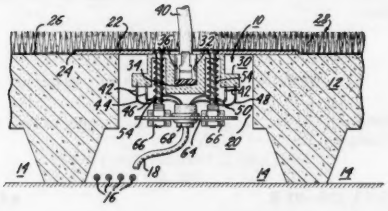
portions pass over said ramp member and are positioned adjacent said flat lock surface so as to lock together said pair of matable electrical connectors, and whereby deflection of said cantilevered beams positions said enlarged portions adjacent said prow like wedge and drawing said enlarged portions along said wedge of said ramp member spreads said cantilever beams apart to permit easy unmating of said matable connectors.

4,273,404

RESILIENTLY SUPPORTED ELECTRICAL FLOOR INSTALLATION

Rolf E. Hedlund, New York, and Thomas J. Hynes, Brentwood, both of N.Y., assignors to Scanorama, Inc., New York, N.Y.

Filed Jul. 30, 1979, Ser. No. 61,821
Int. Cl.³ H01R *33/12*
U.S. Cl. 339—93 R **3 Claims**



1. An electrical installation for making electrical connections in a floor of a building comprising:

a floor plate of relatively thin, substantially flat rigid material adapted to cover in said floor an aperture for access to a source of electrical power beneath the surface of said floor, the periphery of said plate being adapted for mounting on the surface portion of the floor defining said aperture, said plate having an opening for receiving the plug of a cable connected to an electrical device;

connector means mounted beneath said plate, said connector means having first means for receiving and making connection with said plug and having second means for making connection to said electrical source; and

means attached to said plate for resiliently supporting said connector means so that said connector means may be displaced away from said plate by a load less than the load required to damage said connector means,

said connector means comprising an insulative housing, said first means including a receptacle having electrical elements therein for making electrical contact with said plug, said receptacle being substantially aligned with said opening for receiving said plug, said means for supporting comprising spring means, said spring means comprising a pair of helical-type springs,

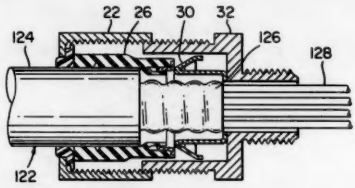
said means for supporting comprising a pair of rods extending axially through said helical type springs and through a pair of apertures provided in said housing, said apertures in said housing each being formed so that said springs do not pass therethrough such that in response to the application of said load said housing slides over said rods resiliently on said springs, said means for supporting also including means for retaining said springs on said rods and means for directly attaching one end of each of said rods to said plate.

4,273,405

JACKETED METAL CLAD CABLE CONNECTOR

Joseph P. Law, Scotch Plains, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Aug. 13, 1979, Ser. No. 65,762
Int. Cl.³ H01R *4/66;* **H02B** *1/12*
U.S. Cl. 339—94 R **22 Claims**



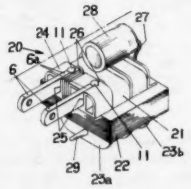
1. A grounding ring for metal-clad cables comprising: a base having a generally circular configuration and defining an aperture to receive a metal-clad cable therethrough; at least two upstanding arms coupled to said base, diametrically opposed and extending perpendicularly to the plane of said base along the extent of a portion of a metal-clad cable passing through said aperture in said base; outwardly inclined arms, one coupled to the free end of each of said upstanding arms adapted to be engaged by a member advanced towards said base to force said upstanding arms into intimate engagement with the metal cladding of a metal-clad cable passing therebetween; and stop means coupled to said base and extending in the direction of said upstanding arms to limit the advancement of a member towards said base.

4,273,406

ELECTRICAL CORD ADAPTER

Kuni Okagami, Kawaniski, Japan, assignor to Mitsuoka Electric Mfg. Co., Ltd., Tondabayashi, Japan

Filed Dec. 28, 1978, Ser. No. 974,023
Int. Cl.³ H01R *3/00, 13/514*
U.S. Cl. 339—147 P **9 Claims**

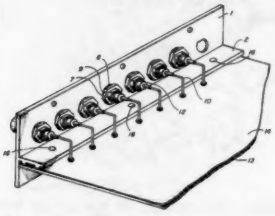


1. An adapter for electric cords, comprising a transformer with a coil bobbin, having plug blades integrally attached thereto; a bottomed, generally cylindrical casing having apertures for receiving said blades and at least one screw inserting aperture formed in its front wall; a bottomed, generally cylindrical lid complementary to said casing and having an internally threaded lid pillar extending from a rear wall surface of said lid toward an open side; temporary fixing means provided on said casing and said lid, respectively, for engagement with each other; wherein said temporary fixing means include first inner and outer clamp walls to define a guide groove therebetween, provided on a peripheral wall of said casing, second inner and outer clamp walls to define a guide groove therebetween, provided on a peripheral wall of said lid, for engaging said first clamp walls, L-shaped apertures formed by notching said first clamp walls, and claws projecting from said second clamp walls for engaging said apertures; and at least one screw for interconnecting said casing with said lid.

4,273,407
COAXIAL CONNECTOR ASSEMBLY FOR ATTACHMENT TO CIRCUIT BOARD

Clifton K. Snuffer, 23 Oak St., Walpole, Mass. 02081, and Walter T. Cuches, 16 Hillcrest Rd., Medfield, Mass. 02053

Filed Oct. 24, 1979, Ser. No. 88,094
Int. Cl.[3] H01R 17/18; H05K 1/18
U.S. Cl. 339—177 R 4 Claims



1. A coaxial connector assembly for enabling a circuit board disposed behind a faceplate of the assembly to be connected in one wave soldering operation to a plurality of the assembly's coaxial connectors, the assembly comprising

(1) a faceplate having apertures therein for receiving at spaced locations coaxial connectors of the type to which a mating coaxial member can be readily attached,

(2) a rib attached to and extending rearwardly from the faceplate,

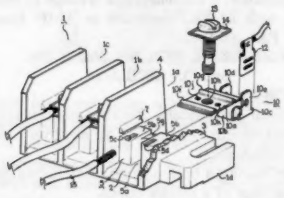
(3) a plurality of coaxial connectors disposed at spaced locations in the apertures of the faceplate, each of said plurality of coaxial connectors being of the type having a center conductor disposed within a conductive outer member which has means enabling a mating coaxial member to be attached in a manner permitting easy disconnection, each of said plurality of coaxial connectors being secured to the faceplate and having its center conductor extending rearwardly beyond the rib, and

(4) standoff means carried by the rib for spacing the rib from the surface of the aforesaid circuit board.

4,273,408
TERMINAL BLOCK ASSEMBLY

Wallace H. Orr, Hendersonville, N.C., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 21, 1979, Ser. No. 13,036
Int. Cl.[3] H01R 9/00
U.S. Cl. 339—198 G 1 Claim

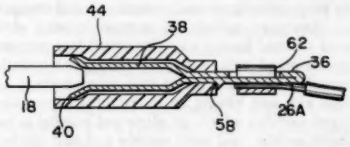


1. Electrical connector device comprising, in combination, an insulating terminal block having a bottom and spaced opposite walls defining a passage, said block having a base portion on the bottom thereof extending between said walls in said passage, said base portion having an upper surface, said walls each having ledge means projecting into said passage and extending along and spaced above the plane of said upper surface of said base portion, a strip-shaped conductive terminal member having a front portion arranged on said upper surface of said base portion in said passage and having opposite marginal portions engaging the undersides of said ledge means of said opposite walls for frictionally holding said terminal member in assembly with said terminal block, and fastener means engaging said terminal member for securing a conductor lead to said terminal member, said terminal member being slidable along said plane with its front portion between said ledge means and the upper surface of said base portion into assembled position on said terminal block, said fastener means comprising a screw passing through and threadably engaging the front portion of said terminal member, said base portion formed with a recess in which said screw is received, said screw coacting with a wall of said recess for preventing withdrawal of said terminal member from said terminal block, said base portion having a rear surface transverse said upper surface, said terminal member having an intermediate portion rearward of and extending downwardly below the plane of said front portion and arranged closely adjacent said rear surface of said base portion in said assembled position for preventing substantial forward movement of said terminal member relative to said terminal block in said position.

4,273,409
CONNECTOR HAVING LOW PROFILE CONTACT ELEMENT

Stephen A. Blanche, Warwick, and Lee Portrais, North Scituate, both of R.I., assignors to Victor Electric Wire & Cable, West Warwick, R.I.

Filed Sep. 4, 1979, Ser. No. 72,163
Int. Cl.[3] H01R 4/18
U.S. Cl. 339—206 P 5 Claims



1. A connector of the type having a molded plug in which at least one contact element is housed within a separate enclosure having spaced upper and lower walls in part defining an open forward end, said contact element having a split terminal portion including a pair of spaced apart legs adapted to receive a male contact element projecting through said enclosure open end, said legs each having a major longitudinally extending body portion terminating in an outwardly angularly flared end disposed in respective contact with said upper and lower walls proximal said open forward end, said contact element leg body portions being generally spaced from said upper and lower walls except at said ends thereof whereby relative inward motion of said male element with respect to said legs tends to force said leg ends slightly forwardly along said walls towards said open enclosure end while simultaneously tending to flatten the disposition angle between said leg ends and said leg body portions, said enclosure including a rear wall having an opening therethrough, rearwardly disposed portions of said leg body portions adapted to pass through said opening and disposed in mutual face-to-face contact with each other both within said opening and at those portions thereof extending into said plug rearwardly of said enclosure rear wall opening, said legs being of essentially flat blade-like configuration, said enclosure rear wall opening being of flat slot-like configuration such that said legs passing in face-to-face disposition therethrough essentially block said rear wall opening such that material forming said plug cannot pass through said rear wall opening during the molding of said plug about said enclosure and said contact element, said leg body rear portions extending rearwardly of said enclosure rear wall opening forming a contact tongue to which an electrical conductor is attached, one of the said body portions of said tongue having an open slot disposed therethrough, said electrical conductor contact-

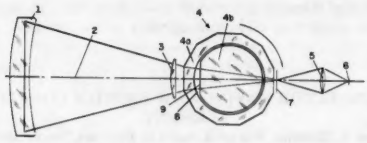
ing the other of said tongue body portions of that face distal from said slot, and a clamp extending about said tongue and said conductor, said clamp having opposite ends disposed in said slot and in contact with the face of said other of said tongue body portions proximal said slot.

4,273,410

POLYGONAL CYLINDER FOR USE IN OPTICAL PICTURE SCANNING SYSTEMS

Josef F. Menke, Glücksburg, Fed. Rep. of Germany, assignor to Electro-Optik GmbH & Co. K.G., Glücksburg, Fed. Rep. of Germany

Filed Jul. 10, 1979, Ser. No. 56,405
Int. Cl.³ G02B 27/17
U.S. Cl. 350—6.2 **2 Claims**



1. In an optical system having an objective lens generating an optical axis, a correcting lens, a polygonal cylinder lens, a transformation lens, and detecting means spaced consecutively and respectively along said optical axis, the improvement comprising:

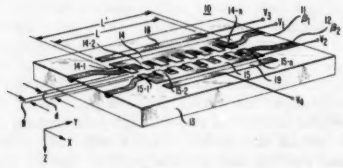
said polygonal cylinder lens having a second axis substantially perpendicular to said optical axis and comprising an inner stationary cylindrical portion located along said second axis and having a single curved face perpendicular to said optical axis, a hollow polygonal cylinder ring mounted for rotation about said inner portion and said second axis and having an outer surface provided with polygon surfaces which are plane and parallel in pairs and an inner surface, said inner surface and said single curved face defining between them an air lens for correcting image distortions of said optical system.

4,273,411

OPTICAL WAVELENGTH FILTER

Rodney C. Alferness, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 24, 1980, Ser. No. 114,832
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.14 **19 Claims**



1. A filter comprising:

a pair of optical waveguides **(11, 12)** embedded in a substrate **(13)** of electrooptical material of lower refractive index;

characterized in that:

said waveguides **(11, 12)** are in coupling relationship over an interval L′ but have sufficiently dissimilar propagation constants (β_1, β_2) to preclude unrestricted coupling therebetween;

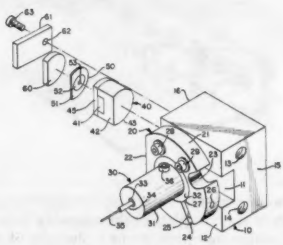
and in that coupling means **(14-1, 14-2 . . . 14-n; 15-1, 15-2 . . . 15-n)** are longitudinally spaced along said interval for inducing selective coupling between wave energy at a wavelength λ_o of one polarization (TE, TM) in one of said waveguides **(11)** and wave energy of an orthogonal polarization (TM, TE) in the other **(12)** of said waveguides.

4,273,412

OPTICAL FIBER COUPLING FITTING

Clarence G. Hillegonds, Palm Bay, Fla., assignor to Harris Corporation, Cleveland, Ohio

Filed Aug. 3, 1978, Ser. No. 930,702
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.20 **13 Claims**



1. An optical fiber coupler fitting for securely coupling an optical fiber to a photo element retained within a mounting fixture comprising:

an optical fiber holding member having a channel extending therethrough in which an optical fiber is secured;

a clamp member having

an aperture therethrough into which said optical fiber holding member may be inserted, and

first means for controlling the size of said aperture so that said holding member may be inserted into said aperture and securely retained therein; and

second means for affixing said clamp member to said mounting fixture, and thereby couple an optical fiber secured in said holding member to a photo element retained within said mounting fixture, wherein said first means comprises a slot provided in said clamp member and extending from a peripheral portion thereof to said aperture, and means for controlling the spacing between opposing faces of said slot and thereby controlling the size of said aperture.

4,273,413

PHOTOELECTRIC ELEMENT/OPTICAL CABLE CONNECTOR

Leonard F. Bendiksen, Harrisburg, and William L. Schumacher, Camp Hill, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 26, 1979, Ser. No. 15,254
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.20 **8 Claims**

1. In a connector for optically coupling an optic transmission cable and a photoelectric element of an electronic circuit, the improvement comprising:

a metal body having a base portion constructed for mounting on a surface of a circuit board,

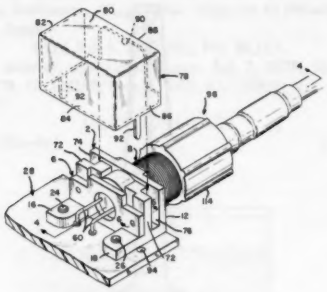
a sleeve portion of said body having a flattened portion for association coplanar with said a surface of a circuit board on which said body is mounted to provide a low profile for said body, said sleeve portion having a profiled bore therethrough,

a photoelectric element mounted in a first resilient ferrule with electrical leads protruding from said ferrule for pluggable connection in a circuit board on which said body is mounted, said ferrule being received in one end of said profiled bore,

means for retaining said ferrule in said bore,

said sleeve being externally threaded to receive a threaded

cap rotatably mounted on a second resilient ferrule provided at the end of an optic cable and pluggably received



in said profiled bore and optically coupling said optic cable and said photoelectric element.

4,273,414

ZOOM LENS

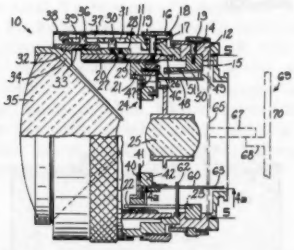
Masatoshi Shimojima, Tokyo, Japan, assignor to Vivitar Corporation, Saata Monica, Calif.

Division of Ser. No. 750,828, Dec. 15, 1976, Pat. No. 4,141,636. This application Dec. 1, 1978, Ser. No. 965,340

Claims priority, application Japan, Jan. 20, 1976, 51-514228

Int. Cl.³ G02B *7/10*

U.S. Cl. 350—429 **5 Claims**



1. A zoom lens comprising a housing member and having two lens groupings axially movable for zooming and maintaining focus, a zoom selection ring exterior of said housing and rotatable thereabout a zoom ring within said housing and rotatable with said selection ring, a first lens mounting member movable axially upon rotation of said zoom ring, a first slot defined in said zoom ring, a sleeve-like member rotatably mounted about said zoom ring and having a follower in said first slot, another follower on said sleeve-like member extending into a second axial guide slot in said housing whereby when said zoom ring rotates said first slot causes said sleeve-like member to move axially in said second slot at a rate determined by the contour of said first slot, a focusing lens mounting member threadably engaged to said sleeve-like member and movable axially thereon upon rotation thereof for focusing, and a focusing ring rotatable on said housing and connected to said focusing lens mount.

4,273,415

OPTICAL OBJECTIVE

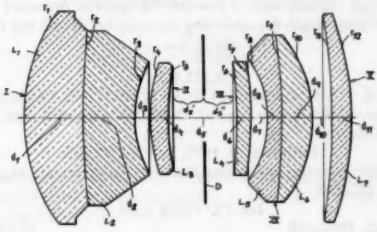
Günther Sonnet, Bad Kreuznach, Fed. Rep. of Germany, assignor to Jos. Schneider & Co., Optische Werke, Bad Kreuznach, Fed. Rep. of Germany

Filed Oct. 16, 1979, Ser. No. 85,238

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1978, 2845247

Int. Cl.³ G02B *9/60*

U.S. Cl. 350—465 **6 Claims**



1. An optical objective consisting of a negatively refracting first component, a positively refracting second component, a positively refracting third components, a negatively refracting fourth component and a positively refracting fifth component, said second and third components being separated by a diaphragm space, said first and second components being coupled for correlated codirectional axial shifts at a relatively slow and a relatively fast rate, respectively, to minimize optical aberrations with different magnification ratios.

2. An optical objective consisting of a negatively refracting first component, a positively refracting second component, a positively refracting third component, a negatively refracting fourth component and a positively refracting fifth component, said components being constituted by meniscus-shaped lenses which are bounded by spherically curved surfaces all concave toward an intervening space separating said second and third components,

said first, second, third, fourth and fifth components having respective individual focal lengths whose absolute magnitudes are related to one another in the ratio of substantially 7.5:1.1:2.7:9.7:1.6.

4,273,416

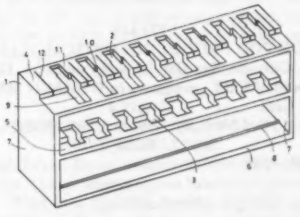
INDICATING TEST TUBE RACK

Alvin S. Blum, 2350 Del Mar Pl., Fort Lauderdale, Fla. 33301

Filed Jan. 2, 1979, Ser. No. 177

Int. Cl.³ B01L *9/06;* **G02B** *7/02*

U.S. Cl. 350—239 **16 Claims**



1. A rack for test tubes and the like comprising: means for holding each of said tubes in two generally stable, easily observable positions, wherein each of said tubes individually may be readily changed from one of said positions to the other of said positions, wherein holding means for each said tube com-

prises individual opening means in said rack, said opening means being generally of a size and shape to cause said tube to pivot about a portion of said tube, while another portion of said tube moves to and fro in a limited channel from one generally stable position to a second generally stable position, wherein a portion of each of said opening means is elongate and said elongate portions are parallel, restricting said tubes to a to and fro motion at this region of said tubes and another portion of each of said opening means restricts said tubes to a pivoting motion at this other region of said tubes.

13. The invention of claim 1, which further comprises: at least one vertical wall of transparent material provided with magnifying means for observing the contents of said test tubes.

4,273,417

REAR VIEW MIRROR FOR AUTOMOTIVE VEHICLES

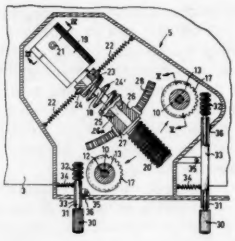
Bernhard Mittelhäuser, No. 57, D-3002 Wedemark 2, Fed. Rep. of Germany

Filed May 9, 1979, Ser. No. 37,463

Claims priority, application Fed. Rep. of Germany, May 11, 1978, 2820541

Int. Cl.³ G02B 5/08

U.S. Cl. 350—289 **15 Claims**



1. An adjustable mirror assembly for automotive vehicles and the like, comprising:

a reflector member;

two setting elements operatively connectible to said reflector member for adjusting the attitude of said reflector member;

an at least pivotally movable electric motor including an output shaft;

a first driving means mounted on said motor output shaft for operatively connecting said motor and a pertaining setting element; and

a second driving means at least in part rotatable mounted on said motor turned shaft for pivotally displacing said electric motor when said electric motor is actuated to bring said first driving means in operative contact with one of said setting elements.

4,273,418

MIRROR FOR PRODUCING OPTICAL ILLUSIONS

Richard L. Gillespie, San Gabriel, and Douglas A. Geller, Monrovia, both of Calif., assignors to WHAM-O Mfg. Co., San Gabriel, Calif.

Filed Nov. 30, 1979, Ser. No. 98,939

Int. Cl.³ G02B 5/08

U.S. Cl. 350—289 **20 Claims**

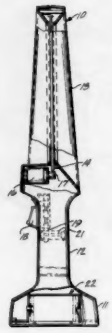
1. A viewing apparatus comprising:

a housing having a central opening;

reflective means mounted in the central opening of the housing, said reflective means having transparent areas and reflective areas disposed over the surface thereof according to a predetermined pattern;

means for rotatably supporting the reflective means at the periphery thereof in the central opening; and

drive means located in the housing linked to the supporting means for causing said reflective means to rotate at a



selectable speed whereby an unobstructed view of both sides of the reflective means is provided.

4,273,419

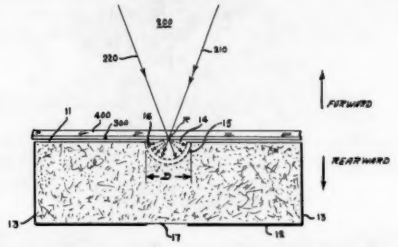
LIGHT-SCATTERING DISC COLLECTOR

Joseph M. Geary, Edgewood, N. Mex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 21, 1980, Ser. No. 132,451

Int. Cl.³ G02B 5/02; G01N 21/00

U.S. Cl. 350—320 **8 Claims**



1. A light-scattering disc collector comprising a member made of material which transmits light and also is non-absorbing and highly scattering as to said light, wherein:

(a) said member has a first flat face and a second flat face which are opaque to light, and which are in parallel-spaced relationship with each other;

(b) said first and second flat faces are joined by a common surface which is opaque to light;

(c) said first flat face has a light-transmissive entrance aperture therein in the form of a cavity which is in the shape of an inwardly disposed hemispherical dome that is light-antireflective coated;

(d) and, said second flat face has a light-transmissive exit aperture in optical alignment with said light-transmissive entrance aperture in said first flat face.

4,273,420
LIQUID CRYSTAL DISPLAY DEVICE

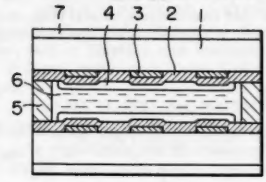
Takeshi Watanabe, Yokohama; Ryoichi Sudo, Yokosuka; Fusaji Shoji, Yokohama; Issei Takemoto, Yokohama, and Hitoshi Yokono, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 9, 1979, Ser. No. 56,119

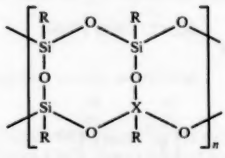
Claims priority, application Japan, Jul. 7, 1978, 53/81891; Oct. 6, 1978, 53/122595; Nov. 6, 1978, 53/135855; Nov. 6, 1978, 53/135857

Int. Cl.[3] G02F *1/133*

U.S. Cl. 350—341 5 Claims



1. A liquid crystal display device having a liquid crytal layer between a pair of substrates, each, having an electrode thereon, which comprises an alignment film of ladder-type organosilicone polymer represented by the following general formula of repetition unit being formed on counter-faced sides of said substrates:



wherein n=25–5,000, X is Si or one of metals of Al, Ti, B, Ge, Sn, P, As, Mg, Pb, Zr, Sb, Cr, Fe, Co, and Ni, and R is at least one member selected from phenyl group, alkyl-substituted phenyl group, halogen-substituted phenyl group, diphenyl group, alkyl-substituted diphenyl group, halogen-substituted diphenyl group, naphthyl group, alkyl-substituted naphthyl group, halogen-substituted naphthyl group, and alkyl groups including methyl group, ethyl group, propyl group, butyl group, amyl group, hexyl group, etc.

4,273,421
SEMICONDUCTOR LIFETIME MEASUREMENT METHOD

Richard W. Gurtler, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 17, 1977, Ser. No. 759,618

Int. Cl.[3] G01N *21/17*

U.S. Cl. 350—353 10 Claims

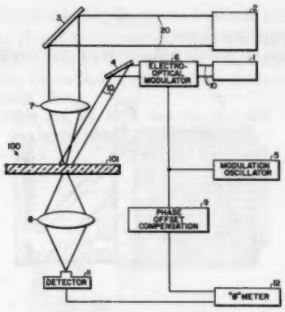
1. A method for measuring semiconductor lifetime comprising:

generating free carriers in a region of the semiconductor with a first modulated optical beam;

modulating a second optical beam with said free carriers;

detecting the modulation of said second optical beam;

comparing the phase of the detected modulation of said second optical beam with the modulation of said first modulated optical beam; and



calculating the lifetime of said free carriers from said compared phase and the frequency of modulation of said first modulated optical beam.

4,273,422
LIGHT VALVE CONTAINING LIQUID SUSPENSION INCLUDING POLYMER STABILIZING SYSTEM

Robert L. Saxe, New York, N.Y., assignor to Research Frontiers Incorporated, Plainview, N.Y.

Continuation-in-part of Ser. No. 932,512, Aug. 10, 1978, Pat. No. 4,164,365, which is a division of Ser. No. 596,198, Jul. 15, 1977, abandoned, which is a continuation-in-part of Ser. No. 476,106, Jun. 3, 1974, abandoned, which is a continuation-in-part of Ser. No. 276,796, Jul. 31, 1972, abandoned. This application Mar. 5, 1979, Ser. No. 17,453

Int. Cl.[3] G02F *1/00, 1/17*

U.S. Cl. 350—362 29 Claims

1. A light valve for controlling the transmission of radiation, which comprises a cell and a liquid suspension in said cell; said liquid suspension comprising:

an electrically resistive liquid suspending medium;

a plurality of small, anisometrically shaped halogen-containing particles suspended in said suspending medium;

a copolymer of at least two different monomers, at least one of said monomers having a sterically unhindered functional group for bonding to or associating with said particles, and at least one of said monomers having a branched group, the distance from the backbone of the copolymer to said sterically unhindered functional group most distant from the backbone being less than the distance from the backbone to the terminal group of said branched group, the branched groups in said copolymer being sufficiently soluble so that the copolymer as a whole is substantially dissolved in said liquid suspending medium; and

a polymer dissolved in said liquid suspending medium and bonded to or associated with said copolymer but not said particles; the amount of said copolymer and said associated polymer being at least sufficient to inhibit agglomeration of said particles.

4,273,423
ZOOM LENS BARREL ASSEMBLY FOR CONSTANT MAGNIFICATION

Kyozo Uesugi, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 17, 1979, Ser. No. 85,527

Claims priority, application Japan, Nov. 4, 1978, 53-136133

Int. Cl.[3] G02B *15/18*

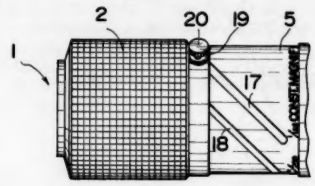
U.S. Cl. 350—429 10 Claims

1. In a zoom lens barrel which includes a stationary barrel and a single operation ring, axial movement of which relative to said stationary barrel causes zooming operation and rotation

of which relative to said stationary barrel causes focusing operation, a device for constant magnification photography comprises:

cam means provided on one of said operation ring and said stationary barrel, and

a guide pin provided on the other of said operation ring and



said stationary barrel and engageable with said cam means, said cam means having a configuration by which said cam means forces said operation ring to rotate upon axial movement of the operation ring through the engagement with said guide pin such that a magnification remains substantially constant during focusing for the varying distance to a focused object.

4,273,424

VARIABLE ABERRATION LENS SYSTEM

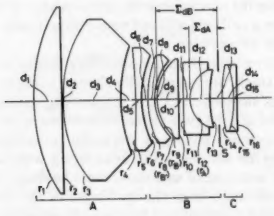
Yuhsuke Nanjoh, Urawa, Japan, assignor to Mamiya Koki Kabushiki Kaisha (Mamiya Camera Co., Ltd.), Tokyo, Japan

Filed May 29, 1979, Ser. No. 42,779

Claims priority, application Japan, May 31, 1978, 53/65048; Oct. 20, 1978, 53/128421

Int. Cl.³ G02B *9/34, 9/64, 13/20*

U.S. Cl. 350—431 **5 Claims**



1. A variable aberration lens system characterized in that said lens system comprises a stop, two cemented lens elements arranged adjacently to said stop and having therebetween a cementing surface which is concave against said stop, and a variable air space arranged between two surfaces having similar radii of curvature which are concave against said stop and capable of varying the spherical aberration; that the condition of

$$0.01 < n_A - n_{A'} < 0.1$$

$$R < |r_A| < 1.4R$$

and

$$0.7\Sigma d_A < |r_A| < 1.4\Sigma d_A$$

are satisfied, wherein N_A represents the refractive index of one on the side far from said stop of said two cemented lens elements, $n_{A'}$ represents the refractive index of the other on the side near to said stop of said two cemented lens elements, r_A represents the radius of curvature of said cementing surface, R represents the radius of the full aperture of said stop and ΣdA represents the axial distance from said cementing surface to said stop; and that the conditions of

$$2R < \left| \frac{r_B + r_{B'}}{2} \right| < 3R \quad \text{and}$$

$$0.7\Sigma d_B < |r_B| < 1.4\Sigma d_B$$

are satisfied, wherein r_B represents the radius of curvature of one near to said stop of said two surfaces, $r_{B'}$ represents the radius of curvature of the other far from said stop of said two surfaces and Σd_B represents the axial distance from said one near said stop of said two surfaces to said stop, and that the following condition is satisfied in at least one of d_{MAX} and d_{MIN}:

$$\Sigma\overset{*}{I}/\Sigma I > 150$$

wherein d_{MAX} represents the maximum width of said variable air space, d_{MIN} represents the minimum width of said variable air space, ΣI represents a sum of the third degree spherical aberration coefficients and $\Sigma\overset{*}{I}$ represents a sum of the fifth degree spherical aberration coefficients.

4,273,425

HIGH SPEED CATADIOPTRIC OBJECTIVE LENS SYSTEM

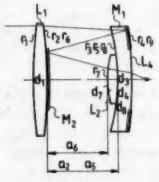
Ludvik Canzek, Unterentfelden, Switzerland, assignor to Kern & Co. A.G., Aarau, Switzerland

Filed Dec. 8, 1978, Ser. No. 967,973

Claims priority, application Switzerland, Dec. 8, 1977, 15052/77

Int. Cl.³ G02B *17/08*

U.S. Cl. 350—444 **4 Claims**



1. A high speed catadioptric objective system lens of the type in which a first single lens (L_1) is convergent, with a main mirror (M_1), a counter mirror (M_2) and a field lens system (L_2, L_4) adjacent to the focal point, wherein only two optical members carry said mirrors and of which at least one member carries an additional lens element, said counter mirror (M_2) surfaced on the central portion of said first single lens (L_1) facing the image side and at least one element (L_2) of said field lens system cemented to the central portion (L_4) of said optical member carrying the main mirror (M_1) and facing the object side, the elements having the following numerical values:

	F = 1:1.2 f = 99.7 s' = 8.7	Thicknesses and Separations	n_d	ν_d
L_1	r1 = +747.831	d1 = 7.5	1.76180	27.0
	r2 = −2214.349	a2 = 46.9		
M_1	r3 = −137.033	d3 = 8	1.68900	49.4
	r4 = −198.791	d4 = d3		
	r5 = r3	a5 = a2		
M_2	r6 = r2	a6 = 41.9		
L_2	r7 = +37.388	d7 = 5	1.46450	65.8
	r8 = r3	d8 = d3		
L_4	r8 = r3	d8 = d3	1.68900	49.4

-continued

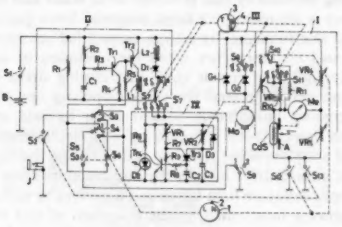
F = 1:1.2 f = 99.7 s' = 8.7	Thicknesses and Separations	n_d	ν_d
r9 = r4			

where f is the focal length of the system, r is the radius of curvature of the indicated elements, and L_4 is the central portion of the main mirror (M_1).

4,273,426
MOTION PICTURE SYSTEM

Hideto Iwama, Kawasaki; Masamichi Toyama; Mamoru Shimazaki, both of Machida, and Toshikazu Ichiyanagi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 11, 1977, Ser. No. 814,850
Claims priority, application Japan, Jul. 14, 1976, 51-83750
Int. Cl.³ G03B *21/38*
U.S. Cl. 352—169 **3 Claims**

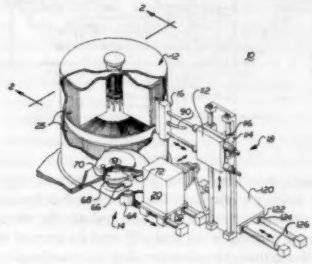


2. A motion picture camera comprising:
(a) a shutter;
(b) a motor;
(c) shutter driving means driven by said motor for driving a shutter between a fully closed position and a fully opened position;
(d) latching means coupled to the driving means and having a latch position for latching said shutter driving means when said shutter is moved to said fully closed position and fully opened position;
(e) a motor switch for electrically energizing said motor when said latching means is in a non-latching position;
(f) electromagnetic means to cause said latching means to move to the non-latching position when energized;
(g) first sensor switch means which becomes conductive when said shutter occupies said opened position;
(h) second sensor switch means which becomes conductive when said shutter occupies said closed position;
(i) a selector member for selecting an interval time exposure mode and a long time exposure mode;
(j) a timer circuit connected to said electromagnetic means for producing pulses at predetermined intervals when the timer circuit operates, and for applying the pulses to energize said electromagnetic means; and
(k) selecting switch means operatively coupled to said selector member, said selecting switch means connecting said first sensor switch means to said electromagnetic means for energizing said electromagnetic means when said first sensor switch means becomes conductive and energizing said timer circuit in the interval time exposure mode, and said selecting switch means connecting said second sensor switch means to said electromagnetic means for energizing said electromagnetic means when said second sensor switch means becomes conductive and connecting said timer circuit to said first sensor switch means for supplying power to said timer circuit when said first sensor switch means becomes conductive state in the long-time exposure mode.

4,273,427
APPARATUS FOR STORING AND RANDOMLY ACCESSING PLANAR FILM RECORDS

David C. Bailey, Cocoa Beach, Fla., assignor to Harris Corporation, Cleveland, Ohio

Filed Jul. 10, 1978, Ser. No. 923,182
Int. Cl.³ G03B *23/08*
U.S. Cl. 353—27 A **10 Claims**



1. Apparatus for storing and randomly accessing a plurality of planar film records, comprising record storing means for storing said planar film records in a close, side by side relationship in corresponding known locations in said record storing means, including location defining means for confining said film records to specific locations by restraining two opposing edges of said film record from movement in at least a direction normal to the plane of said film record, film record retrieval means for retrieving a selected film record from said record storing means by grasping said selected film record by an edge other than said two opposing edges and then withdrawing said film record from said film storing means, and control means for causing said retrieval means to retrieve a selected film record from said record storing means by causing said retrieval means to retrieve the film record from the location in said record storing means in which said film record is known to be stored, wherein said record storing means further includes backstop means for providing a backstop against which said planar film records may be forced by said retrieval means during the retrieval of a selected film record, and wherein said retrieval means includes means for forcing said selected film record against said backstop means during said retrieval of said selected film record, so as to thereby cause said planar film record to flex slightly between said retrieval means and said backstop means, thereby forcing said grasped edge of said selected film record into a known alignment with said film retrieval means.

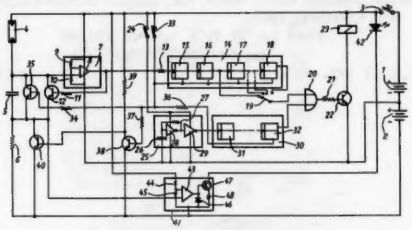
4,273,428
DIGITAL EXPOSURE-DURATION CONTROL CIRCUIT WITH UPPER LIMIT ON EXPOSURE DURATION

Kurt Borowski; Eduard Wagensonner, both of Aschheim, and Istvan Cocron, Munich, all of Fed. Rep. of Germany, assignors to AGFA Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Apr. 24, 1979, Ser. No. 32,902
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1978, 2818606
Int. Cl.³ G03B *7/093*
U.S. Cl. 354—23 D **7 Claims**

7. An exposure duration control circuit, comprising: a photosensitive element; a first pulse generator connected to the photosensitive element and producing a first pulse train having a frequency which is dependent upon intensity of ambient scene light incident upon the photosensitive element; an adjust-

able counter connected to the first pulse generator and counting pulses, the adjustable counter being adjustable in dependence upon film speed and operating in a manner that when the adjustable counter has counted a number of pulses which the counter has been adjusted to count, the adjustable counter produces a first output signal which can cause an exposure to



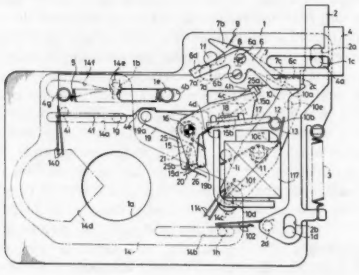
be terminated; a second pulse generator generating a second pulse train having a constant frequency and connected to the adjustable counter; a switch connected to the second pulse generator and turning it on and off; and an output stage connected to the adjustable counter and responding to the first output signal in a manner that whenever the first output signal is generated, an exposure will be terminated.

4,273,429

ELECTRIC SHUTTER DEVICE PROVIDED WITH AN ELECTRIC SELF-TIMER

Kunio Arisaka, Urawa, and Kenta Namioka, Tokyo, both of Japan, assignors to Copal Company Limited, Tokyo, Japan

Filed Apr. 20, 1979, Ser. No. 31,967
Claims priority, application Japan, Apr. 21, 1978, 53/46669
Int. Cl.³ G03B *9/64, 7/14*
U.S. Cl. 354—30 **4 Claims**



1. An electric shutter device provided with an electric self-timer comprising:

a shutter plate,

a release member movably supported on said shutter plate,

a closing drive member movably supported on said shutter plate and capable of moving between its cocked position and its uncocked position and capable of being locked in the cocked position by said release member,

a timer lever rotatably supported on said shutter plate and capable of locking said closing drive member in the initial period of the movement of said closing drive member from its cocked position to its uncocked position,

an armature lever supported rotatably on said shutter plate and operatively connected with said timer lever,

an electromagnet mounted on said shutter plate and capable of attracting said armature lever,

an exposure time controlling circuit having an output terminal thereof connected to said electromagnet through a first resistor,

a current amplifying circuit having an output end thereof connected to said electromagnet to make a large current instantaneously flow to said electromagnet,

a pulse generating circuit having an output terminal thereof connected to the input terminal of said curent amplifying circuit,

a self-timer delaying circuit having an output terminal thereof connected to the input terminal of said pulse generating circuit, and

a current source switch arranged adjacently to said release member and capable of feeding a current to said electromagnet through said exposure time controlling circuit and first resistor by the initial motion of said release member,

said current being for the purpose of causing said electromagnet to generate a magnetic force insufficient to attract said armature lever when said armature lever is apart from the attracting surface of said electromagnet but sufficient to keep said armature lever in the attracted state when said armature lever is in contact with the attracting surface,

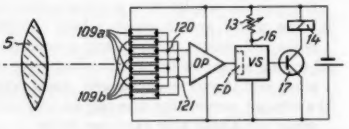
the locking of said closing drive member by said timer lever being released by said armature lever when said armature lever is attracted by a large magnetic force generated in said electromagnet by a large current fed instantaneously to said electromagnet when the operation of said self-timer delaying circuit ends, said closing drive member being moved to start the shutter opening operation and becoming immediately locked again by said armature lever having been attracted by said electromagnet, and said armature lever being rotated to release the locking of said closing drive member by said armature lever when a proper exposure time lapses and a current to said electromagnet is interrupted by the operation of said exposure time controlling circuit, said closing drive member being again moved to close the shutter.

4,273,430

PHOTOGRAPHIC CAMERA

Rainer Fritsche, Wetzlar, and Klaus-Dieter Schaefer, Braunfels, both of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Continuation of Ser. No. 958,067, Nov. 6, 1978, abandoned. This application Jul. 10, 1980, Ser. No. 167,370
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1977, 2750068
Int. Cl.³ G01P *3/36*; G03B *17/20*
U.S. Cl. 354—31 **6 Claims**



1. A photographic camera apparatus comprising:

circuit means including photosensor means for generating an electrical signal proportional to the degree of relative movement between an object to be photographed and said camera apparatus,

an imaging optical device having an image plane for imaging the object to be photographed,

means for generating a control signal in response to said relative movement electrical signal,

indicator means responsive to said control signal for indicating an unacceptable camera setting,

means mounting said photosensor means at least in the vicinity of the image plane of said imaging optical device,

said photosensor means comprising a plurality of individual

photosensors arranged in two mutually perpendicular directions forming a photosensor matrix,

said circuit means comprising operational amplifier means having first and second inputs and an output connected to said means for generating,

means parallelly interconnecting alternate ones of said individual photosensors of said matrix forming thus a first and a second group generating first and second electrical sum signals, respectively, and

means connecting said first and second electrical sum signals to said first and second inputs, respectively, of said operational amplifier means.

4,273,431

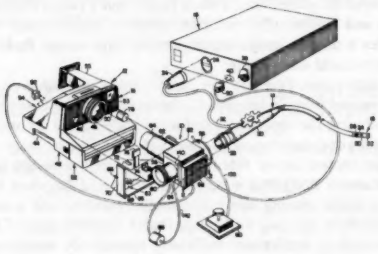
ADAPTER FOR COUPLING A PHOTOGRAPHIC CAMERA WITH A VIEWING DEVICE

Zane M. Farmer, Ashburnham, and Edward A. Yobaccio, Westwood, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 2, 1979, Ser. No. 63,254

Int. Cl.³ G03B *7/087, 17/48;* A61B *1/04*

U.S. Cl. 354—59 **14 Claims**



1. An adapter for optically and mechanically coupling a photographic camera to the proximal end of an optical viewing device such as an endoscope so that the image formed by the optical viewing device can be viewed and photographed wherein the camera is of the type which includes an exposure control system having a light sensing system and which, upon actuation, automatically regulates the exposure delivered to a film in accordance with the speed rating of the film and the amount of light received by the light sensing system of the camera exposure control system and wherein the optical viewing device is of the type which has an eyepiece located at its proximal end for forming a viewable image of the object and includes means by which the object can be illuminated, said adapter comprising:

a housing section for forming a releasable generally light-tight mechanical connection with the proximal end of the optical viewing device and structured to form a branched light path having a primary branch the entrance of which optically aligns with the optical viewing device eyepiece when said housing section is connected thereto and along which the viewable image formed by the eyepiece can be directly viewed through the exit of said primary branch and having a secondary branch depending from said primary branch at a predetermined angle;

optical means disposed in said housing section for receiving light traveling along said primary light path branch and directing a portion of it into and along said secondary light path branch so that the viewable image formed by the eyepiece can be photographed through the exit of said secondary light path branch;

means for releasably attaching the camera to said housing section so that the camera objective lens is aligned in a predetermined manner with the exit of said secondary light path branch for purposes of photographing the eyepiece viewable image while the camera light sensing system is not aligned with said secondary light path branch exit;

light detecting means structured, in part, to be electrically actuated and arranged along said housing section branched light path for movement between a first at rest arrangement in which said light detecting means, upon electrical actuation, provides an output signal having an electrical characteristic which varies in a predetermined manner with the brightness of the eyepiece viewable image and in which the viewable image is visually unobstructed when observed along said primary light path branch and a second arrangement in which both said primary and secondary light path branches are unobstructed so that the eyepiece viewable image can be simultaneously viewed and photographed;

means for precluding ambient light from entering the camera light sensing system;

control means including circuit means for monitoring said light detecting means output signal while said light detecting means is in its first arrangement and determining an exposure parameter value which is appropriate for the film speed and the brightness of the eyepiece viewable image, for displacing said light detecting means from its first to its second arrangement, for actuating the camera to begin its exposure cycle, and for presenting within said light precluding means an artificial source of illumination to cause the camera light sensing system to terminate the camera exposure cycle in accordance with said exposure parameter value.

4,273,432

MOTOR DRIVEN CAMERA

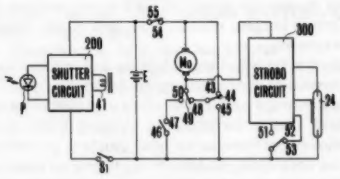
Mutsuhide Matsuda, Yokohama; Hideo Tamamura, Tokyo; Tetsuya Taguchi; Tadashi Okino, both of Kawasaki, and Mutsunobu Yazaki, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 31, 1979, Ser. No. 71,544

Claims priority, application Japan, Sep. 8, 1978, 53-111068; Sep. 14, 1978, 53-113049

Int. Cl.³ G03B *15/05*

U.S. Cl. 354—145 **5 Claims**



1. A motor driven camera including:

a shutter mechanism;

a winding mechanism for transporting a film and for charging a shutter;

a flash device;

an electric motor for driving said winding mechanism;

an electrical power source for supplying electrical energy to said motor and said flash device;

means for detecting the completion of a film winding operation;

shutter release means;

a first switch cooperative with said release means for interrupting the supply of electrical energy to said flash device during the time when the shutter is in operation;

a second switch cooperative with said detecting means for interrupting the supply of electrical energy to said flash device during the time when said motor is supplied with electrical energy, and for supplying electrical energy to

said flash device when the completion of the film winding operation is detected by said detecting means;

a film rewinding mechanism;

changeover means for activating said film rewinding mechanism; and

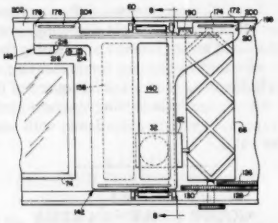
a rewind control switch connected in series to said second switch and arranged to be closed in response to said changeover means.

4,273,433

TWO-BLADED SHUTTER MECHANISM FOR MICROFICHE CAMERA

Philip R. Norris, North Reading, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 29, 1979, Ser. No. 98,492
Int. Cl.[3] G03B *9/40, 27/32*
U.S. Cl. 354—246 **15 Claims**



1. A camera for exposing a plurality of image areas on a single card-like film unit, said camera comprising:

means for supporting such a film unit at a film plane;

means for defining a plurality of image areas disposed in a row on the film unit at said film plane;

an image forming lens;

means mounting said lens for movement along a path of travel substantially parallel to said row of image areas;

means, including a rotatable member, for advancing said lens in increments along said path to successively locate said lens in imaging relation with each of said image areas for exposure;

a shutter for selectively blocking and unblocking the transmission of image forming light along an optical path passing through said lens to effect exposure of an image area, said shutter including an opening blade mounted for movement between an initial blocking position and terminal unblocking position for initiating an exposure, a closing blade mounted for movement between an initial unblocking position and a terminal blocking position for terminating the exposure, and means for biasing said opening and closing blades toward their respective terminal positions; and

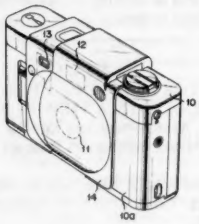
means for controlling movement of said opening and closing blades including a control member mounted for rotation and coupled to said rotatable member for simultaneous rotation therewith for releasably holding said opening and closing blades at their respective initial positions when said rotatable member is at a predetermined initial position, for releasing said opening blade for movement to its said terminal unblocking position while maintaining said closing blade at its said initial position in response to rotation of said rotatable member through a first arc segment past said initial position and for releasing said closing blade for movement to its said terminal position in response to rotation of said rotatable member through a second arc segment beyond said first arc segment.

4,273,434

PHOTOGRAPHIC CAMERA

Yoshihisa Maitani, Hachioji, and Yuichi Sato, Kanagawa, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 20, 1979, Ser. No. 59,334
Claims priority, application Japan, Sep. 14, 1978, 53/113370
Int. Cl.[3] G03B *17/02*
U.S. Cl. 354—288 **5 Claims**



1. In a photographic camera whose body is provided on one side with an object lens, a main finder and a range finder window and on the other with an eyepiece window and which carries a double image-superimposing type range finder, the improvement comprising:

a slide cover fitted to the camera body and adapted to be moved linearly lengthwise thereof between a first position closing the object lens and main finder and a second position opening the object lens and main finder;

a protective cover fitted to and rotatably mounted on the camera body and adapted to be moved between a first position closing the range finder window and a second position opening said range finder window; and

a coupling mechanism resiliently operatively interconnecting the slide cover and protective cover to cause the protective cover to take the first and second positions when the slide cover is moved to the first and second positions.

4,273,435

METHOD AND ARRANGEMENT FOR ELIMINATING AMMONIA VAPORS FROM DEVELOPED DIAZO COPY MATERIAL

Robert K. Hewelt, 3275 Hagerman, Leonard, and Edward F. Dohring, Westland, both of Mich., assignors to Robert K. Hewelt, Leonard, Mich.

Filed May 7, 1979, Ser. No. 36,478
Int. Cl.[3] G03D *7/00*
U.S. Cl. 354—299 **5 Claims**

1. In a diazo copying machine of the type including means for passing exposed diazo copying material to be developed through a development chamber wherein said copy material is exposed to ammonia developing vapors, the improvement comprising:

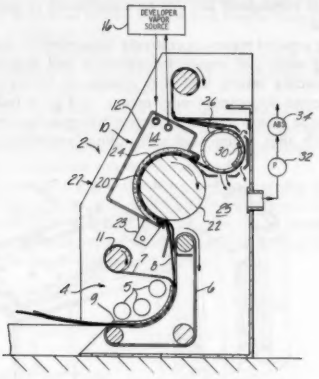
a degassing chamber having an inlet for receiving copy material from the development chamber and an outlet for degassed copy material;

means for evacuating ammonia vapors in said degassing chamber out of said degassing chamber;

a stationary convex contact surface having a width at least equal to the width of the copy material located in said degassing chamber;

heater means heating said contact surface to a temperature on the order of 180°-250° F; and

feed means for drawing copy material through the outlet of the degassing chamber and imposing forces on the copy material which draw the copy material into sliding contact with the heated convex contact surface.

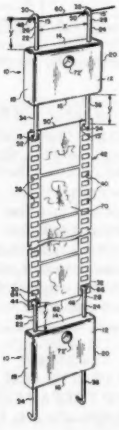


4,273,436

DEVICE FOR SUPPORTING AND PREVENTING CURLING OF PHOTOGRAPHIC FILM DURING DEVELOPING THEREOF

Philip Drell, Skokie, Ill., assignor to Sima Products Corporation, Chicago, Ill.

Filed Dec. 21, 1979, Ser. No. 106,031
Int. Cl.[3] G03D *13/08*
U.S. Cl. 354—344 5 Claims



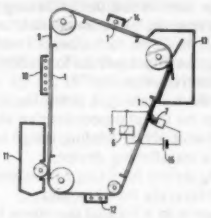
1. A device for use in the selective supporting and weighting of a strip of photographic film having parallel rows of sprocket holes in hanging disposition comprising, a one-piece body including a pair of opposed surfaces, arm means rigid with and projecting beyond one of said surfaces to terminate in an outer end remote from said surface, a pair of return bent hooks rigid with said arm means proximate the outer end thereof and projecting laterally therefrom, the hooks of said pair of hooks being spaced from each other a distance approximately the same as the distance between the parallel rows of sprocket holes whereby said pair of hooks may be inserted within respective ones of the sprocket holes and means on said body engageable with a support for suspending the strip in said hanging disposition.

4,273,437

BEARING PLATE FOR A BAND OF PHOTOCONDUCTIVE RECORDING MEDIUM

Jürgen Neumann, Liederbach, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 24, 1979, Ser. No. 60,224
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1978, 2832775
Int. Cl.[3] G03G *15/00*
U.S. Cl. 355—3 BE 10 Claims



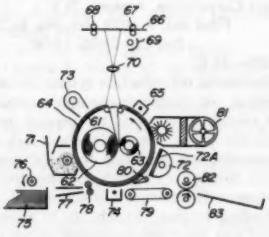
1. A bearing plate for a moving band of photoconductive recording medium, wherein the band is provided with perforations close to and parallel to one of its two longitudinal edges and is adapted to be contacted by a metal brush pressing against the recording medium in the zone of the perforated longitudinal edge, said bearing plate comprising a base plate of a conductive material having at least one aperture therethrough and an electrically conductive grid covering said aperture, said grid being positioned such that it is contacted by the metal brush through the perforations in the photoconductive recording medium.

4,273,438

ELECTROSTATOGRAPHIC PRINTING METHOD AND APPARATUS

Masaji Nishikawa, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 21, 1978, Ser. No. 962,798
Claims priority, application Japan, Nov. 24, 1977, 52-139816
Int. Cl.[3] G03G *15/00*
U.S. Cl. 355—14 CU 4 Claims



1. An electrophotographic duplicating apparatus which can be driven into a multiple copy printing mode with a master for forming a plurality of duplicated copies of an original with the aid of the master which is formed by fixing a toner image corresponding to an image of the original onto a photoconductive sheet, by repeatedly subjecting in succession the master to uniform charging, uniform exposure, development and then

transferring and into an electrophotographic printing mode without the master, to thereby form at least one duplicated copy of the original by subjecting a photoconductive sheet to uniform charging, imagewise exposure, development and transferring, comprising:

a drum, said drum is rotatably arranged and is provided with a supply roll and a takeup roll of the photoconductive sheet wound around an outer surface of the drum;

means for rotating the drum,

a corona charger arranged along the drum for uniformly charging the photoconductive sheet;

means for projecting the optical image of the original onto the uniformly charged photoconductive sheet to form an electrostatic latent image on the sheet;

a developer arranged along the drum for developing the electrostatic image to form a toner image;

a toner image transferring device arranged along the drum for transferring the toner image onto an image receiving member;

a lamp arranged along the drum for uniformly irradiating the photoconductive member;

a first fixing device arranged along the drum for fixing the toner image on the photoconductive sheet;

a device for successively feeding image receiving members through the transferring device;

a second fixing device for fixing a transferred toner image on the image receiving member; and

means responsive to a manual operation for controlling the operation of all of said aforementioned devices whereby in the multiple copy printing mode with, said master, the master is formed by operating the drum rotating means, the corona charger, the image projecting means, the developer device and the first fixing device and then a plurality of copies are formed by repeatedly operating the corona charger, the uniformly irradiating device, the developer device, the transferring device, the image receiving member feeding device and the second fixing device, and in the electrophotographic printing mode without master, the electrostatic image is formed on the photoconductive sheet by operating the drum rotating means, the corona charger and the image projecting means and then at least one copy is formed by operating the developer device, the transferring device, the image receiving member feeding device and the second fixing device.

4,273,439

DOCUMENT FEEDER SYSTEM HAVING A SUSPENDING/COMMENCING MODE WITH A JUDGMENT DECISION CAPABILITY

Harvey R. Markham, Westminster, and Roger D. Shepherd, Nederland, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 9, 1979, Ser. No. 55,711

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 C **14 Claims**

1. In a document reproduction system, including a document feeder system, an electrophotographic copier system and a copy exit system, configured to suspend processing a prior task, commence processing a subsequent task and then, recommence processing said prior task, the improvement comprising:

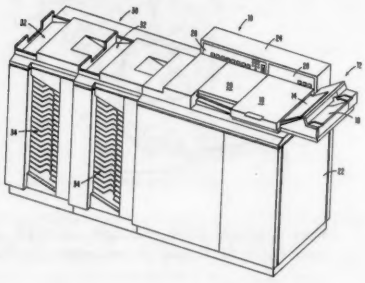
means for entering a suspending/commencing mode;

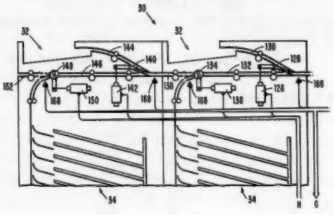
first document feeder means of said document feeder system for feeding original documents to a document viewing glass of said electrophotographic copier system for copying thereof;

second document feeder means of said document feeder system for feeding original documents to a document viewing glass of said electrophotographic copier system for copying thereof;

prior task document queue means of said document feeder system, operatively connected to said first and second document feeder means for storing an original document of said prior task during said suspending/commencing mode, and for refeeding said original document of said prior task back onto said document viewing glass of said electrophotographic copier system, after completion of said subsequent task for recommencing of said prior task; and

logic control means operatively connected to and cooperating with said means for entering said suspending/commencing mode, said first document feeder means, said second document feeder means, said prior task document queue means and said electrophotographic copier system such that when said suspending/commencing mode is





entered, operation of either said first or said second document feeder means processing said prior task is suspended based on a judgment decision, determined in accordance with predetermined criteria, whether to finish the copying of said original document of said prior task on said document viewing glass and then feed the first original document of said subsequent task onto said document viewing glass, or whether to immediately feed said original document of said prior task into said prior task document queue and then feed said first original document of said subsequent task onto said document viewing glass.

4,273,440

METHOD AND APPARATUS FOR DATA COLLECTION AND PREPARATION

Horst Froessl, Gutenbergstrasse 2-4, Hemsbach, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 829,249, Aug. 30, 1977, abandoned. This application Oct. 12, 1979, Ser. No. 84,174

Int. Cl.³ G03B *27/52*

U.S. Cl. 355—40 **17 Claims**

1. A metod of precollecting and organizing selected segments of data from a plurality of source records comprising the steps of

providing a plurality of source records, each having a plurality of human-readable, analog data segments thereon in a known format;

identifying selected ones of the human readable data segments which are to be collected;

defining a sequence in which the identified segments are to

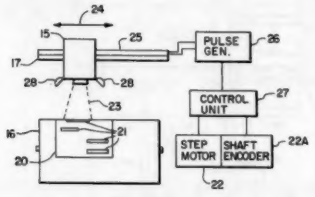
be collected and arranged, which sequence is different from and independent of the format in which they appear on the source record;

providing at least one recording apparatus capable of recording an optical representation of a visible image placed within its field of view;

successively positioning each source document and the apparatus relative to each other such that portions thereof are within the field of view; and

successively recording optical representations of the identified data segments in analog form in the defined sequence on a record from which analog representations of the identified segments can be reproduced.

11. An apparatus for precollecting and organizing selected segments of data from each of a plurality of source records, each of the records being of the type having a plurality of human readable data segments thereon in a known format, comprising the combination of



means for sequentially delivering individual ones of said source records to a recording station;

camera means at said recording station having

optical means for forming an image of a portion of a source record in the field of view thereof, and

record forming means for storing an analog record of the portion of a source record in the field of view when actuated;

means for providing relative movement between said source record and said camera means so that predetermined areas of said source record are brought into said field of view; and

control means for repeatedly actuating said camera means during said relative movement so that selected data segments in said selected areas are recorded in a desired sequence independent of the original format of said source records.

4,273,441

ELECTROPHOTOGRAPHIC COPYING APPARATUS

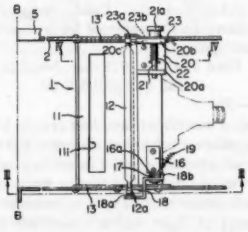
Mitsuru Nagoshi, Hachioji, Japan, assignor to Konishiroku Photo Industry Co. Ltd., Tokyo, Japan

Filed Sep. 17, 1979, Ser. No. 76,071

Claims priority, application Japan, Sep. 19, 1978, 53-114064

Int. Cl.³ G03B *27/54*

U.S. Cl. 355—67 **7 Claims**



1. In an electrophotographic copying apparatus including a pair of spaced frame members having rails mounted thereon for guiding a reciprocatable copy board supporting an original to be copied, an illuminating lamp located between the pair of frame members, and a reflector mirror of a predetermined configuration mounted in association with the illuminating lamp so as to direct light rays emitted by the illuminating lamp toward the copy board; the improvement comprising:

said reflector mirror being formed as a single, unitary structure and including a rearwardly-extending ledge directly and rigidly supporting the illuminating lamp on said ledge at a fixed, predetermined position and orientation with respect to the reflector mirror whereby the need for further relative adjustment therebetween is obviated.

4,273,442

SPECTRAL PHOTOMETER FOR MEDICAL APPLICATIONS

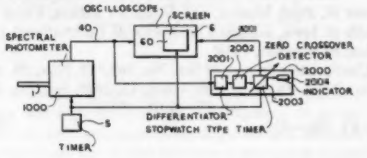
Dietrich W. Lübbers, Dortmund, Fed. Rep. of Germany, assignor to Max Planck Gesellschaft zur Förderung der Wissenschaften e.V., Göttingen, Fed. Rep. of Germany

Filed Apr. 6, 1979, Ser. No. 27,850

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1978, 2815074

Int. Cl.³ G01J *3/34*; G01N *33/48*

U.S. Cl. 356—326 **4 Claims**



1. A spectral photometer for medical applications, comprising:

a spectral photometer stage providing a spectral display signal from a sample under investigation;

a display unit responding to the spectral display signal and visually displaying it to a user;

a maximum detector responding to the spectral display signal and detecting successive maxima therein; and

an intermaximum calculator cooperating with the maximum detector and cooperating with the display to visually display distance between successive maxima in the spectral display signal.

4,273,443

METHOD AND APPARATUS FOR MEASUREMENT OF RERADIATION IN PARTICLE FLOW CELL SYSTEMS

Walter R. Hogg, South Miami, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Filed Nov. 21, 1979, Ser. No. 93,311

Int. Cl.³ G01N *21/49, 21/85*; G02B *27/12*

U.S. Cl. 356—343 **32 Claims**

1. Apparatus for measuring the directional distribution of radiant energy reradiated from a particle for particle characterization which comprises:

A. a source of radiant energy arranged to project an incident beam of radiant energy along a first axis,

B. a sensing zone on said first axis,

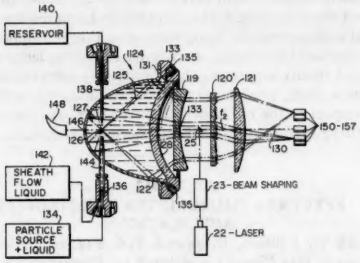
C. means for moving particles through said sensing zone to produce reradiation including scattering of the radiant energy from the beam,

D. means for collecting a portion of said reradiated radiant energy,

E. means for collimating at least a portion of the collected radiant energy,

F. means for deviating the collimated radiant energy selectively with respect to different geometric portions of the collimated radiant energy,

G. means for focusing the different deviated geometric portions of the collimated radiant energy at different respective locations, and



H. means for measuring the intensity of the radiant energy focused at each location.

4,273,444

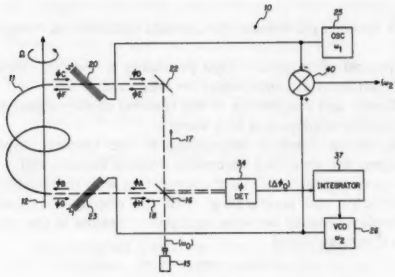
INTERFEROMETER GYROSCOPE HAVING RELAXED DETECTOR LINEARITY REQUIREMENTS

Robert H. Pool, Marion, and Glenn W. Sellers, Cedar Rapids, both of Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 962,519, Nov. 20, 1978, abandoned. This application Jun. 13, 1979, Ser. No. 48,207

Int. Cl.³ G01C *19/64*

U.S. Cl. 356—350 **7 Claims**



1. An interferometer gyro, comprising:

a source of light;

first means for modulating a fixed frequency onto a first portion of the light of said source of light;

second means for modulating a variable frequency onto a second portion of the light of said source of light;

a light path having an axis of sensitivity, the rotation of said light path about which is desired to be measured disposed whereby said modulated first component traverses said light path in one direction and said second modulated component traverses said light path in an opposite direction;

said first and second modulating means each being operative upon a respective one of said first and second light portions before it has traversed said light path and a respective other of said light portions after it has traversed said light path;

means for producing a signal representing the phase difference between said first and second modulated portions introduced by the rotation of said light path about said axis of sensitivity as said first and second portions traverse said light path;

and means for integrating said phase difference representing signal, operative to change said variable frequency to produce a null phase difference representing signal, whereby the difference between said fixed and variable frequencies represents the rate of rotation of said light path about said axis of sensitivity.

4,273,445

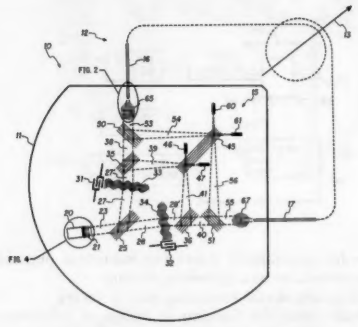
INTERFEROMETER GYROSCOPE FORMED ON A SINGLE PLANE OPTICAL WAVEGUIDE

David E. Thompson, Placentia; Shi-Kay Yao, Brea; Rudolf R. August, Laguna Beach, and Dean B. Anderson, Whittier, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 936,678, Aug. 23, 1978. This application Jul. 30, 1979, Ser. No. 62,210

Int. Cl.³ G01C *19/64*

U.S. Cl. 356—350 **24 Claims**



1. An interferometer gyroscope, comprising:

a substrate,

a single optical waveguide layer on said substrate, said waveguide layer being configured in a single plane,

a source of laser light,

means for introducing said laser light from said source into said optical waveguide layer in a single beam,

means for dividing said single beam into first and second beams in said optical waveguide layer,

means for directing said first and second beams in opposite directions along a path encompassing an axis of rotational sensitivity,

means for receiving said first and second beams from said path and directing said first and second beams in said optical waveguide layer for detection,

and means for detecting a phase difference between said received first and second beams to indicate a rotation of said gyroscope about said axis of rotational sensitivity.

4,273,446

LIGHT SPOT POSITION SENSOR FOR A WAVEFRONT SAMPLING SYSTEM

Richard H. Pohle, Cupertino, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

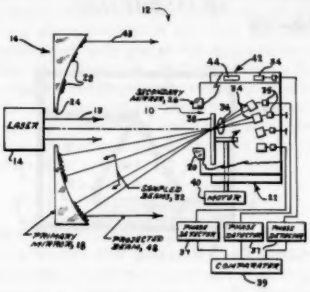
Filed Jun. 26, 1979, Ser. No. 52,163

Int. Cl.³ G01B *9/02*

U.S. Cl. 356—354 **8 Claims**

1. In a grating wavefront sampling system having means for providing a quasi-monochromatic beam of light, a beam expander made up of a primary and a secondary mirror, means on said primary mirror for diffracting a portion of said quasi-monochromatic beam of light thereby establishing at least one diffracted beam of light and a wavefront sensor optically aligned with said diffracted beam of light, the improvement therein being in the form of a light spot position sensor incorporated within said wavefront sensor, said light spot position

sensor comprising means optically aligned with said diffracted beam of light for detecting the intensity of said diffracted beam of light, means positioned adjacent to said intensity detecting means and in optical alignment with said diffracted beam of light for interrupting said diffracted beam of light at a predetermined period of time so as to produce two frequency components, said diffracted beam of light producing a spot of light on said light interrupting means, the relative position of which is unknown, means for providing a spot of light having two frequency components and the position of which is known,



means for detecting the intensity of said known spot of light, means operably connected to said intensity detecting means of said unknown and said known spot of light, respectively, for separating the frequency components thereof, means operably connected to said frequency separating means for detecting the phase of each of said frequency components of said unknown and said known spot of light and means operably connected to said phase detecting means for comparing each of said phases of said unknown and said known spot of light thereby providing a signal representative of the relative spot position difference between said unknown and said known spot of light.

4,273,447

PIVOTABLE MOUNT FOR SCANNING UNIT

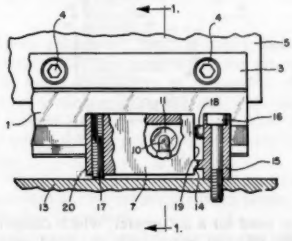
Gunther Nelle, Bergen, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Oct. 5, 1979, Ser. No. 82,105

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1978, 2844066

Int. Cl.³ G01B *11/14, 11/04*

U.S. Cl. 356—373 **9 Claims**



1. In a measuring instrument for determining the relative displacement of a first object with respect to a second object, said instrument including a measuring scale mounted to the first object and a scanning unit for scanning the measuring scale, the improvement comprising:

a mounting member mounted to a second object;

an elastic bridging member interposed between and fixedly coupled to the mounting member and the scanning unit such that the bridging member forms a joint which permits the scanning unit to pivot with respect to the mounting member about an axis substantially perpendicular to the plane of the measuring scale but substantially prevents movement of the scanning unit in any direction inclined to the plane of the measuring scale and thus maintains a substantially constant spacing between the measuring scale and the scanning unit; and

means for selectively adjusting the angular position of the scanning unit with respect to the mounting member and for selectively locking the scanning unit rigidly in place with respect to the mounting member.

4,273,448

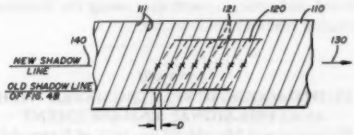
MEASURING METHOD AND APPARATUS

Frederick S. Schiler, 3375 Oak Rd., Stow, Ohio 44224

Filed Jun. 4, 1979, Ser. No. 44,987

Int. Cl.³ G01B *11/14;* G02B *27/60;* H01F *21/04*

U.S. Cl. 356—374 **7 Claims**



1. In a method of measuring movement wherein primary and secondary windings comprising a multiplicity of series-connected conductors are respectively disposed on a movable and a fixed object and one of said windings is energized to produce a secondary voltage varying in magnitude according to the relative position of the objects, the improvement comprising:

(A) disposing said conductors at an angle other than 90° with respect to the path of movement; and

(B) adjusting the magnitude of the secondary voltage by displacing said conductors on the movable object transversely of the path of movement of the movable object a fixed distance to increase or decrease the linear count for a given linear movement.

4,273,449

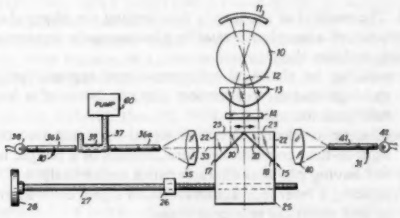
RADIATION MEASURING APPARATUS

Carl J. Schmid, Port Washington, N.Y., assignor to Peerless Electronics Research Corp., Westbury, N.Y.

Filed Feb. 28, 1979, Ser. No. 15,943

Int. Cl.³ G01N *21/85;* G02B *27/14*

U.S. Cl. 356—411 **14 Claims**



1. In apparatus for measuring a characteristic of a sample, in combination:

a source of radiation;

means for receiving radiation from said source and directing the same along a stationary optical path;

at least one optical system disposed in spaced relationship

with said stationary optical path along an axis which intersects said path;

a sample holder in position to receive radiation from the at least one optical system;

radiation dividing means located along said stationary optical path at its intersection with said axis for receiving radiation from said source and for dividing the received radiation into separate beams, the dividing means directing one of the beams through said at least one optical system to a sample in said sample holder, said one beam passing through said sample to modify the intensity of said one beam;

a detector for receiving said one beam from said sample and for detecting the intensity of the received beam;

a carriage for supporting the radiation dividing means; and

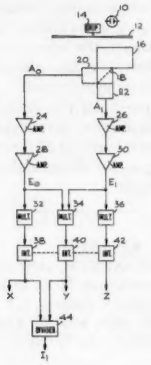
means for moving said carriage along said axis to similarly move the radiation dividing means and thereby vary the intensity of said one beam, the movement of said carriage along said axis away from said at least one optical system increasing the intensity of the radiation reaching said sample, and the movement of said carriage along said axis toward said optical system decreasing the intensity of the radiation reaching said sample.

4,273,450

PHOTOACOUSTIC SPECTROMETER WITH ANALYSIS-SIGNAL ENHANCEMENT

Atsuo Watanabe, and Masahiro Uno, both of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Tokyo, Japan

Filed Sep. 28, 1979, Ser. No. 80,167
Int. Cl.³ G01N *21/00*
U.S. Cl. 356—433 **10 Claims**



1. The method of accurately determining the physical characteristics of a sample material by photoacoustic spectrometry which includes the steps of;

producing an electrical reference-signal representative of the light-to-heat conversion characteristics of a known reference material;

producing an electrical sample-signal representative of the light-to-heat conversion characteristics of a sample material having physical characteristics under study;

producing a reference autocorrelation signal corresponding to said electrical reference-signal;

producing a sample autocorrelation signal corresponding to said electrical sample-signal;

cross-correlating said reference autocorrelation signal and said sample autocorrelation signal to produce a cross-correlation signal; and

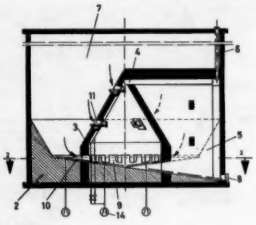
performing predetermined mathematical operations upon selective combinations of said reference autocorrelation signal, said sample autocorrelation signal and said cross-correlation signal to derive desired physical characteristics of said sample material.

4,273,451

MIXING CHAMBER SILO WITH IMPROVED MIXING

Werner Krauss, Hamburg, Fed. Rep. of Germany, assignor to Claudius Peters AG, Hamburg, Fed. Rep. of Germany

Filed Jun. 22, 1979, Ser. No. 51,169
Claims priority, application Fed. Rep. of Germany, Jun. 26, 1978, 2827991
Int. Cl.³ B01F *13/02*
U.S. Cl. 366—101 **6 Claims**



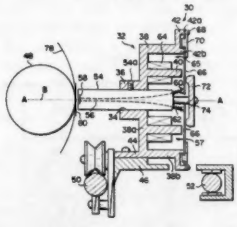
1. A mixing chamber silo having a main silo chamber to which the material can be fed from above, and having a floor and a silo discharge and a pneumatic mixing chamber connected with the silo discharge and arranged on the floor of the main silo chamber, the mixing chamber having a lower wall portion and a conical upper wall forming a roof portion, material inlet orifices in the lower wall portion, and additional material inlet orifices disposed in the conical upper wall or roof portion of the mixing chamber, communicating with the silo interior to receive additional material from the silo at different levels therein to facilitate spout formation and mixing of material.

4,273,452

PRINT HEAD FOR A DOT PRINTER

Hiroshi Honma, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 19, 1979, Ser. No. 76,926
Claims priority, application Japan, Sep. 29, 1978, 53-133785
Int. Cl.³ B41J *3/12*
U.S. Cl. 400—124 **1 Claim**



1. A print head for a dot printer, which comprises:

a plurality of print wires each provided with a printing portion at the forward end;

printing portion guiding means for guiding the respective forward end printing portions of the print wires in a given direction when the print wires are lengthwise driven; and

an electromagnet unit for driving the selected print wires to impress characters in dots, which comprises electromagnets and armatures provided for the respective print wires, and in which the armatures, when attracted by the electromagnets, drive the print wires and wherein the magnetic

circuit of the electromagnet unit consists of an integrally formed circuit member; said magnetic circuit member comprising:

a boss common to the electromagnets; yokes for the respective electromagnets which yokes comprise radially arranged arms provided in the same number as the print wires and radially extending from the boss for substantially the same distance spaced from each other to reach approximately the same circumference, said circumference defining an axis, and parallel arranged arms extending from the outer ends of the radially arranged arms approximately in parallel with the axis of said circumference for a given distance in the same direction spaced from each other; pole pieces for magnetizing coils for mounting the respective electromagnets which pole pieces extend from the radially arranged yoke arms substantially in parallel with the parallel arranged arms at the prescribed space therefrom; and a yoke arm deformation-preventing ring connected to the outer ends of all the parallel-arranged arms.

4,273,453

SELECTIVELY ENGAGEABLE RIBBON RE-INKING DEVICE FOR INK RIBBON CARTRIDGE

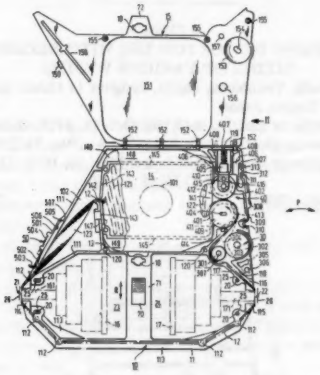
Johannes Haftmann, Borchen-Doerenhagen, Fed. Rep. of Germany, assignor to Nixdorf Computer AG, Paderborn, Fed. Rep. of Germany

Filed Jun. 28, 1979, Ser. No. 53,140

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1978, 2830657

Int. Cl.³ B41J *33/10*

U.S. Cl. 400—196.1 **3 Claims**



1. A selectively engageable ribbon re-inking device for an ink ribbon cartridge having a storage chamber provided with an inlet and an outlet opening for an endless ink ribbon and having a ribbon guide device connected with the storage chamber for guiding the endless ink ribbon from the outlet opening through at least one printing region to the inlet opening, comprising:

an inking roller mounted for rotation about a stationary axis on the cartridge and having the periphery thereof contacting the endless ink ribbon;

a feed roller mounted on a rocker adjacent said inking roller for rotation about a stationary axis and storing a supply of ink, said feed roller being selectively engageable with said inking roller and being arranged to be replaceable;

said rocker being shiftably mounted on said cartridge and being movable between a first position in which said feed roller engages said inking roller for transferring a portion of said ink supply from said feed roller to said inking roller, and a second position in which the feed roller is disengaged from said inking roller;

a manually shiftable activating element mounted exteriorly of said cartridge for engagement with said rocker, said activating element being movable between an activated position and a released position for moving said rocker from said second position thereof to said first position thereof, said activating element being lockable in said activated position; and

a spring element carried by said activating element for urging said rocker toward said activating position thereof.

4,273,454

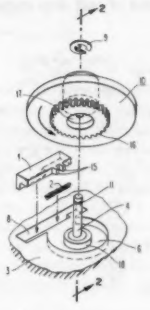
TAPE TENSIONING MECHANISM

Stavros M. Anagnostopoulos, Lansdowne, Pa., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jun. 15, 1979, Ser. No. 48,906

Int. Cl.³ B41J *33/14*

U.S. Cl. 400—234 **9 Claims**



1. A tape tensioning device comprising:

a capstan, comprising means for securing a spool of tape thereto, a toothed gear wheel and a flange of greater diameter than said wheel;

a slider provided with at least one tooth sized to be engaged with said toothed gear wheel; and

a spring;

said slider being biased in one direction by said spring and sliding within a recess so sized that said slider can be advanced, in the opposite direction only, a distance sufficient that the teeth thereon are permitted to slip with respect to those on said toothed gear wheel, said recess being enclosed by said flange so that escape of said slider and said spring is prevented.

4,273,455

JUSTIFYING TEXT WRITING COMPOSING MACHINE

W. S. Gubelmann, deceased, late of Convent, N.J.; by Walter S. Gubelmann, executor, Palm Beach, Fla., and William R. Grier, New Vernon, N.J., assignors to Realty and Industrial Corporation, Morristown, N.J.

Division of Ser. No. 732,973, Oct. 15, 1976, which is a division of Ser. No. 213,045, Dec. 28, 1971, Pat. No. 3,993,179. This application Sep. 25, 1978, Ser. No. 945,802

Int. Cl.³ B41J *19/62*

U.S. Cl. 400—309 **4 Claims**

1. A bidirectional proportional spacing carrier moving mechanism for a carrier of an electric typewriter, comprising:

a ratchet wheel with teeth having a predetermined pitch for determining incremental proportional spacing units;

means coupling said ratchet wheel to said carrier for bidirectional rotation in synchronism with bidirectional linear movement of said carrier;

first force exerting means for urging said carrier in a first direction to cause said ratchet wheel to be urged in a given rotational direction;

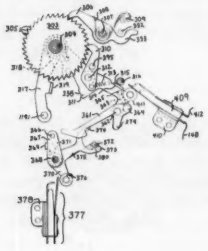
detent means normally engaged with said ratchet wheel for preventing rotation thereof in said given direction, to thereby prevent movement of said carier in said first direction;

first control means for momentarily disengaging said detent means from said ratchet wheel to permit rotation of said ratchet wheel in said given direction by said first force exerting means;

an incremental spacing control member having a first end pivotally mounted adjacent said ratchet wheel, and a stop engaging surface remote from said wheel;

a pawl normally engaged with one of said teeth and pivotally mounted on said control member, for preventing rotation of said ratchet wheel in said given direction when said detent means is disengaged therefrom;

a plurality of stop members disposed in mutual alignment adjacent said stop engaging surface, at least two of said stop members being selectively movable in and out of the path of movement of said stop engaging surface,



said stop members permitting incremental rotational movement of said stop engaging surface, pawl and ratchet wheel in said given direction and linear movement of said carrier in said first direction, by a distance corresponding to a desired number of proportional spacing increments;

second force exerting means for urging said control member to rotate in a direction to move said stop engaging surface away from said stop members and to cause said pawl to rotate said ratchet wheel in a direction opposite to said given direction, to drive said carrier for linear movement in a second direction opposite to said first direction; and

releasable means for momentarily rotating said control member against the force exerted by said second force exerting means to move said pawl a distance corresponding to a desired number of second direction spacing increments, until said stop engaging surface engages one of said stop members,

said second force exerting means acting upon release of said control member by said releasable means to move said carrier in said second direction by said desired number of second direction spacing increments.

4,273,456

PAPER INSERTION APPARATUS FOR A TYPEWRITER

John J. Bisczat; Robert R. Lisk; William R. McCray, all of Lexington, and James L. Sizemore, Cynthiana, all of Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 26, 1978, Ser. No. 945,922
Int. Cl.³ B41J *19/76*
U.S. Cl. 400—550 **8 Claims**

1. Semi-automatic paper insertion apparatus for use in a typewriter of the kind that establishes a printing line and has keyboard apparatus for producing coded signals and means including a platen for defining a paper feed path,

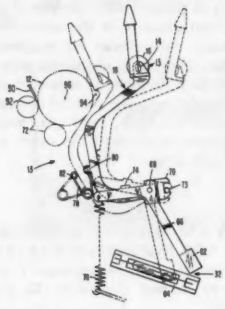
said paper insertion apparatus comprising:

an operator-manipulable paper hold-down device having a first position at the paper feed path and a second position which is away from the paper feed path;

means for detecting the presence of said hold-down device in said second position and for producing a corresponding detection signal;

an indexing device for receiving an indexing control signal and for advancing paper along said paper feed path in accordance with said indexing control signal; and

control circuit means for receiving said detection signal, said control circuit means including means for storing a code indicating a paper feed distance along said paper feed path for a first line of printing and means, responsive to said



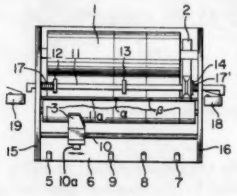
detection signal, for accessing said code and for supplying a corresponding set of indexing control signals to said indexing device whereby paper insertion to a first line for printing is effected.

4,273,457

RECORDING DEVICE FOR USE WITH RECORDING MEDIA OF VARIOUS WIDTHS

Atsushi Noda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 843,166, Oct. 17, 1977, abandoned. This application Aug. 31, 1979, Ser. No. 71,729
Claims priority, application Japan, Nov. 16, 1976, 51/137541
Int. Cl.³ B41J *29/42*
U.S. Cl. 400—705.1 **7 Claims**



1. A recording device comprising:

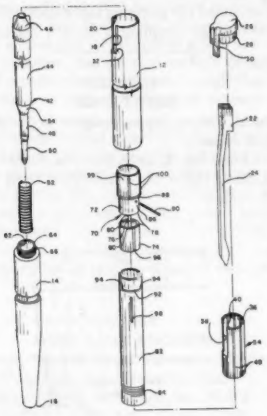
(a) recording means for writing information on a recording medium; and

(b) logic control means including a plurality of first detecting means for detecting the width of the recording medium loaded in said recording device, said plurality of first detecting means including switching means actuable in response to the loading of the recording medium, second detecting means for detecting the position of the recording means in accordance with the width of the recording medium loaded in said recording device, said logic control means being responsive to said first detecting means and said second detecting means to generate a signal for controlling said recording means in accordance with the width of the recording medium loaded in said recording device.

4,273,458
WRITING IMPLEMENT

James W. Mansheim, Fort Madison, and William M. Martz, Donnellson, both of Iowa, assignors to Textron Inc., Providence, R.I.

Filed Sep. 26, 1979, Ser. No. 79,110
Int. Cl.³ B43K 24/06
U.S. Cl. 401—109 10 Claims



1. An operating mechanism for a writing or similar implement of the type having an elongate housing with an axially oscillable cap portion and a longitudinally reciprocal unit, said mechanism being characterized by

(A) a drive member disposed within said housing and comprised of

(i) an upper sleeve section oscillable conjointly with said cap portion,

(ii) a lower sleeve section coaxial with said upper sleeve section and reciprocal conjointly with said unit,

(iii) the lower surface of said upper sleeve section and the upper surface of said lower sleeve section being contiguous, and

(iv) link means disposed between and pivoted on said sleeve sections at generally diametrically opposed points on said contiguous surfaces,

(B) connecting means releasably coupling said drive member to said housing and supporting said upper sleeve section for said oscillable but against reciprocal movement and said lower sleeve section for said reciprocal but against rotary movement,

(C) said link means swiveling around said pivot points in response to conjoint oscillation of said cap portion and said upper sleeve section, said link means swiveling around said pivot points between

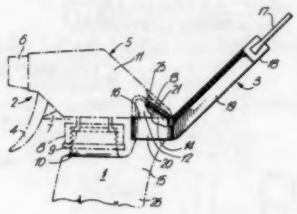
(i) a folded transverse position pulling said sleeves together and retracting said unit in response to relative rotation of said pivot points to a generally diametrically opposed position, and

(ii) an erect longitudinal position pushing said sleeve sections apart and extending said unit in response to relative rotation of said pivot points to a generally diametrically aligned position.

4,273,459
SQUEEGEE DEVICE FOR LIQUID DISPENSING BOTTLE

Pierre J. Hardy, 4210 St. Denis St., Apt. #2, Montreal, Quebec, Canada (H2J 2K8)

Filed Nov. 13, 1978, Ser. No. 960,083
Int. Cl.³ A47L 1/08, 13/03
U.S. Cl. 401—139 2 Claims



1. A squeegee device for attachment to a fluid dispensing bottle, the fluid dispensing bottle having a trigger operated fluid dispensing mechanism, the fluid dispensing mechanism having retained thereon a screw-threaded cap, the cap being freely rotatable relative the fluid dispensing mechanism and being screw engageable about an axis with a screw-threaded neck of the bottle, the bottle having a projection locatable within a correspondingly shaped recess defined by a shaped skirt forming a part of the fluid dispensing mechanism, the projection and the recess spaced from said axis for preventing relative rotation of the bottle and the dispensing mechanism about the axis;

the squeegee device having a blade with a free flexible outer edge and a rigid inner edge, an elongate support member extending from the inner edge, said support member having a shaped portion including a substantially rectangular frame shaped to closely surround the projection and a clamping member extending from one part of the frame to another part of the frame and shaped to fit snugly around said projection and within the recess, the clamping member having a plate-like portion extending in a plane substantially perpendicular to a longitudinal axis of the support member, the clamping member insertable between the projection and the recess in a position in which the squeegee device extends in a direction substantially opposite to a fluid dispensing direction of said fluid dispensing mechanism, said shaped portion lockable in said position on said cap being screwed down on the neck of the bottle thereby preventing the squeegee device from twisting about said axis.

4,273,460
AXLE CONSTRUCTION FOR FOUR WHEEL DRIVE VEHICLES OR THE LIKE

Mitsuo Ueno, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jul. 30, 1979, Ser. No. 61,803
Claims priority, application Japan, Aug. 11, 1978, 53-109452
Int. Cl.³ B60B 27/00; F16D 1/06
U.S. Cl. 403—1 2 Claims

1. In a vehicle having multiple sets of driven wheels, an axle construction comprising:

a drive shaft;

a hollow spindle disposed coaxially about said drive shaft;

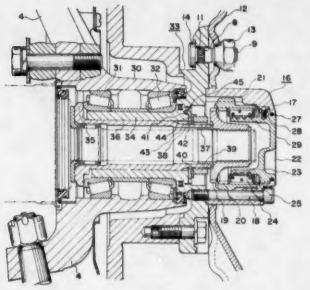
a wheel hub having a hollow shaft portion, said hollow shaft portion coaxially disposed within said hollow spindle;

at least one bearing having an inboard end mounted between and rotatably supporting said hollow shaft portion relative to said hollow spindle;

a free running hub provided between said drive shaft and

said wheel hub for providing a selective drive connection therebetween;

a bearing support having an outboard end, said bearing support fitted within said hollow shaft portion of said wheel hub and spaced from said drive shaft, said bearing support having a flange engageable with said inboard end



of said at least one bearing for securing same on said hollow shaft portion;

a washer fitted on said outboard end of said bearing support and engageable with said wheel hub; and

a hub nut engaged with said outboard end of said bearing support for retaining said washer on said bearing support.

4,273,461

COUPLING OF THE BALL-AND-SOCKET JOINT TYPE

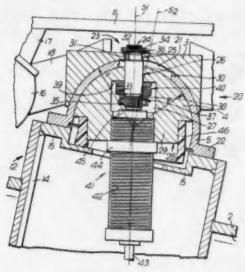
Gunnar M. T. Kjellstrand, Framnäsvägen 3; Olof Olofsson, Hotellvägen 10, both of S-683 00 Hagfors, and Anders G. Linder, Bergsvägen 12, S-663 00 Skoghall, all of Sweden

Filed Jun. 26, 1979, Ser. No. 52,229

Claims priority, application Sweden, Jul. 13, 1978, 7807787

Int. Cl.³ F16C *11/06*; F16D *1/12*

U.S. Cl. 403—125 **9 Claims**



1. A coupling of the ball-and-socket joint type for coupling a first object and a second object, said coupling comprising a first coupling member connected to the first object and a second coupling member connected to the second object, said first coupling member comprising a joint socket having a spherical radius (R) and a joint ball having a smaller radius (r) than that of the joint socket, the central axis of the joint ball when fixed coinciding with that of the joint socket, and a gap having a width corresponding to the difference (R−r) between said radii being formed between the joint socket and the joint ball, said second coupling member comprising a shell which is disposed between the joint socket and the joint ball and is the form of a portion of a sphere, the outer and inner radii (R and r) of which coincides with the radii (R and r) of said joint socket and said joint ball so that said shell can completely fill the gap between the joint socket and the joint ball and can be displaced in various directions by sliding in said gap, said coupling also including gripping means including at least one spring for urging said joint ball and said joint socket towards one another with sufficient force so that the interposed shell can be locked in the desired position to thereby lock the two objects in the desired position in relation to one another, and said coupling further comprising disengaging means for releasing said coupling when a fresh locking position is to be assumed, said disengaging means being an independent unit in relation to said gripping means and comprising means for compressing said at least one spring to at least a sufficient extent so as to cancel the gripping force exerted by said at least one spring so that the coupling is thereby released.

4,273,462

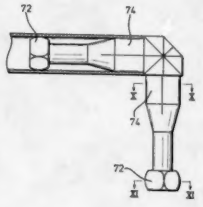
JOINT UNIT

Shigeki Fukuchi, Tokyo, Japan, assignor to Metako Kigyo Co., Ltd., Tokyo, Japan

Filed Jul. 2, 1979, Ser. No. 53,725

Int. Cl.³ F16D *1/00*; F16B *7/00*; E04B *7/08*

U.S. Cl. 403—171 **13 Claims**



1. A joint unit for hollow frame elements comprising a base support and at least one connection member extended therefrom, said connection members being provided with at least two axially separated contacting sections having peripheral contours adapted to engage the inner wall of the frame elements, at least one of the contacting sections being substantially twisted about the axis of the connection member relative to the other contacting section to thereby skew said contours relative to each other.

4,273,463

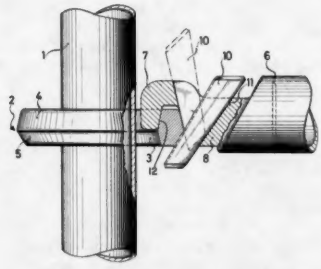
STEEL TUBE SCAFFOLD

Gerhard Dobersch, No. 10, Adolf-Kaschny-Strasse, 5090 Leverkusen, Fed. Rep. of Germany

Filed Oct. 3, 1979, Ser. No. 81,510

Int. Cl.³ E04G *7/00*

U.S. Cl. 403—246 **3 Claims**



1. Tubular metal scaffolding comprising:

(a) a plurality of substantially vertical tubular posts, each having at least one bracket thereon, and a plurality of substantially horizontal tubular braces, each having at

least one hook-like jaw for engaging a bracket on a tubular post;

(b) each said bracket on said tubular posts comprising a member extending in a direction transverse to the longitudinal axis of and being spaced from its tubular post, at least a portion of the surface of said member facing said tubular post and at least a portion of the surface of said member opposite said tubular post each being at different acute angles with respect to said axis of said post,

(c) each said hook-like jaw on said tubular braces for engaging a bracket of a post being adapted to be secured to said bracket with the interior surface of said jaw contacting said member including said portion of said surface facing said post, said jaw having an aperture passing therethrough in a direction transverse to and in communication with said member, the interior surface of said aperture facing said member being at an acute angle that is different from said first mentioned angles with respect to said axis of said post;

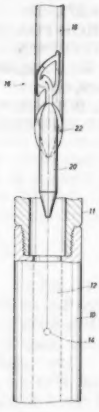
(d) said scaffolding further comprising an elongated wedge adapted to be inserted in said aperture in said jaw after said jaw is placed in engagement with said member of said bracket such that the opposite surfaces of said wedge simultaneously engage said surface of said aperture facing said member and said portion of said surface of said bracket member opposite said post to lock together and prevent separation of said bracket and said jaw.

4,273,464

WIRE LINE ANCHOR

Anthony C. Scott, Norfolk Great Yarmouth, England, assignor to Eastman Whipstock, Inc., Houston, Tex.

Filed May 8, 1979, Ser. No. 36,305
Int. Cl.³ B25G *3/00*; E21B *23/00*
U.S. Cl. 403—348 **2 Claims**



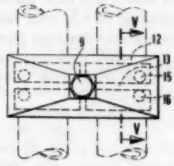
1. Apparatus for attaching an anchor connected to a wire line to an anchor housing located in a pipe string in a well bore and for releasing the anchor from the anchor housing by raising and lowering the anchor with the wire line relative to the housing, comprising an anchor housing for connecting in a pipe string located in a well bore, an anchor for attaching to a wire line for movement into and out of the pipe string, said anchor housing having an opening to receive the anchor and a key attached to the housing and extending into the opening to engage the anchor, said anchor having a section with a cylindrical outer surface in which a slot system is formed to receive the key and to move the anchor relative to the key to position the key in the slot system to hold the anchor from upward movement relative to the anchor housing upon the downward movement of the anchor relative to the key a distance limited by the key and the slot system and the subsequent upward movement of the anchor by the wire line a distance limited by the key and the slot system to allow an upward force to be applied to the wire line and for releasing the anchor from the housing by lowering the anchor until further downward movement is prevented by the key and the slot system and moving the anchor upwardly to move the key out of engagement with the slot system.

4,273,465

PIPE CLAMP

Otmar Schoen, Am Kirschenberg 5, D 6601 Scheidterberg 5, Fed. Rep. of Germany

Filed Aug. 7, 1979, Ser. No. 64,517
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1978, 7825626[U]
Int. Cl.³ F16B *7/02*; F16L *3/22*
U.S. Cl. 403—391 **9 Claims**



1. In an apparatus for fastening two pipes together including two holding bodies, each having two recesses disposed therein in side-by-side relationship, said recesses in one of said holding bodies facing the recesses in the other of said holding bodies to thereby define two substantially circular receiving areas for the reception of the two pipes; two clamping elements enclosing said holding bodies therebetween; an attaching element penetrating said clamping elements and said holding bodies; first means on one of said clamping elements for supporting said attaching element; and a second means on the other of said clamping elements for releasably connecting said attaching element thereto via rotation, the improvement comprising:

locking means, located on said clamping element containing said first means and on the adjacent holding body, for preventing relative rotation therebetween,

said locking means comprising

a rib extending in a cavity on the upper side of said adjacent holding body, and

two projections extending from the bottom side of said clamping element into said cavity and engaging said rib therebetween.

4,273,466

BASIN

Karl W. Trahan, Sr., Lafayette, La., and Timothy S. Smith, Eunice, La., assignors to Kar Fabricators, Inc.

Filed May 29, 1979, Ser. No. 43,264
Int. Cl.³ E01F *5/00*
U.S. Cl. 404—4 **2 Claims**

1. A preformed catch basin for mounting with a drainage pipe for catching fluids including running rain water, streams, and the like to prevent flooding, comprising:

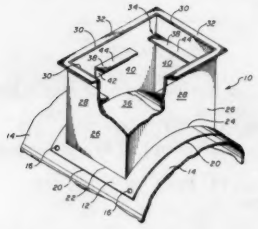
(a) frame means for mounting around the opening in the drainage pipe to enable mounting of said catch basin around the opening;

(b) riser means extending from said frame means, said riser means having an opening therein communicating with the opening in the drainage pipe and opening at its other end for receiving fluids;

(c) grid support means attached around the interior periphery of said riser means and positioned between the opening of said frame means communicating with the opening

in the drainage pipe and the opening at the other end of said frame means; and

(d) grid means positioned for preventing oversized and unwanted debris and trash entering into the drainage pipe wherein said catch basin enables fluids to enter said open-



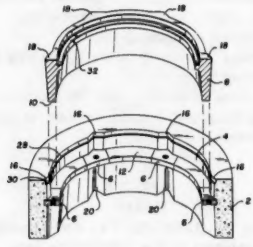
ing of said riser means and flow through said grid means, through said opening of said riser means communicating with the opening of said drainage pipe to deposit fluids in said drainage pipe while said grid means prevents oversized articles and/or trash from being deposited in said drain and/or sewer pipes.

4,273,467

ADJUSTABLE MANHOLE COVER SUPPORT

Allan D. Cronk, West Vancouver, Canada, assignor to Cremo Supply Ltd., West Vancouver, Canada

Filed Jun. 25, 1979, Ser. No. 51,595
Claims priority, application Canada, Oct. 13, 1978, 313373
Int. Cl.³ E02D *29/14*
U.S. Cl. 404—26 **7 Claims**



1. An adjustable manhole cover support comprising:

an outer ring having a circular internal opening;

a plurality of threaded members disposed about the circular opening;

an insert dimensioned to fit within the outer ring to a depth controlled by the abutment of the insert against the threaded members;

studs to engage and to extend through the threaded members to abut an under surface of the insert to provide control of the depth of the insert into the outer ring and the angulation of the insert, the studs being defined by bolts having enlarged heads; and

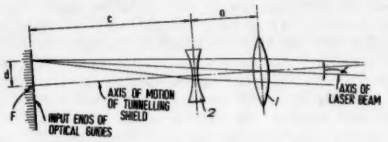
a locking member loosely fitted on the head of the bolt and able to contact sides of the ring when in contact with the head to prevent rotation of the bolt.

4,273,468

TUNNELLING SHIELDS AND LIKE MOVEABLE APPARATUS

Tadeusz R. Cyfka, London, England, assignor to Balfour Beatty Limited, Surrey, England

Filed Mar. 23, 1978, Ser. No. 889,242
Int. Cl.³ E21D *9/00*
U.S. Cl. 405—132 **22 Claims**



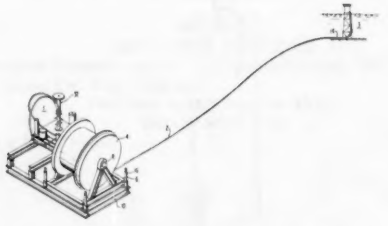
1. A method of determining corrections to be applied to the motion of a tunnelling shield to maintain or restore motion of the shield along a predetermined path, which method comprises directing a beam of collimated light along, or in a direction parallel to or at a fixed angle with, the axis of the predetermined path of the tunnelling shield; focussing said beam on to the input end of an optical cable carried by the shield and comprising a plurality of optical fibres, the input ends of said optical fibres being arranged in an array in which the position of the input end of each optical fibre relative to that of another is fixed; and displaying light transmitted through the optical fibres on to a device at which the output ends of the optical fibres are so arranged as to facilitate ready determination of any correction required to be applied to the motion of the tunnelling shield to maintain or restore motion of the tunnelling shield along said predetermined path.

4,273,469

SYSTEM AND METHOD FOR LAYING SUBSEA PIPELINES

Peter A. Lunde, Houston, Tex., assignor to Santa Fe International Corporation, Orange, Calif.

Filed Mar. 12, 1979, Ser. No. 19,609
Int. Cl.³ B21D *3/02*; E21B *43/013*; F16L *1/04*
U.S. Cl. 405—158 **15 Claims**



1. A system for laying subsea pipelines, said system comprising: a reel; a pipeline wound on said reel; support means for rotatably supporting said reel, said support means and said reel with said wound pipeline being submergible to a seabed; securing means including a base structure capable of being secured on the seabed and means for attaching said support means to said base structure; and means for drawing said pipeline off of said reel from the location of said support means towards a desired termination location.

13. A method for installing subsea pipelines comprising the steps of: winding the pipeline to be installed onto a reel; mounting the reel on a support member in such a manner that the reel is rotatable on the support member; submerging the support member and the reel to a seabed; securing the support member to the seabed; drawing the pipeline off of the reel from the location of the support member towards a desired termination

location; and connecting the free end of the pipeline at the termination point.

4,273,470

OFFSHORE PRODUCTION RISER WITH FLEXIBLE CONNECTOR

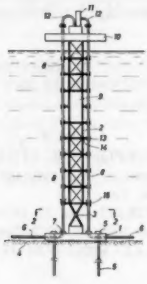
Everhard C. Blomsma, and Paulus T. M. Holtslag, both of Rijswijk, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jan. 16, 1979, Ser. No. 3,698

Claims priority, application United Kingdom, Jan. 20, 1978, 2383/78

Int. Cl.³ E02D *21/00;* **E21B** *17/01*

U.S. Cl. 405—202 **11 Claims**



1. Offshore installation comprising a base carrying at least one fluid conduit and adapted to be placed on the sea bottom, an oblong structure adapted to be substantially vertically positioned in the water, a joint interconnecting said base and the lower end of said structure in a manner allowing the structure to sway in the water when the base is placed on the sea bottom, at least one substantially straight pipe coupled at one end thereof to the fluid conduit of the base extending upwards substantially parallel to the structure, and a plurality of supports forming support means between the pipe and the structure to restrict lateral displacements of the pipe with respect to the structure, wherein the lowermost support of the support means is constituted by a guide sleeve that is situated at a level above the joint and is of a length greater than the support means above said sleeve and is of an internal diameter to allow up to 3° deviation between the central axis of the sleeve and the central axis of the pipe.

4,273,471

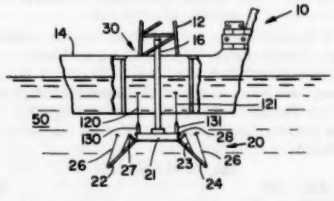
MARINE-DRILLING SUB-BASE ASSEMBLY FOR A SOFT-BOTTOM FOUNDATION

Ben G. Burke, Lafayette, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jun. 13, 1979, Ser. No. 48,130

Int. Cl.³ E02B *17/02;* **E02D** *27/52*

U.S. Cl. 405—203 **12 Claims**



1. A drilling sub-base assembly for use at a site under a body of water having a soft-bottom foundation wherein drilling operations are conducted through a moon pool of an offshore drilling vessel, comprising:

a main section of the drilling sub-base assembly dimensioned for ease of passage through the moon pool, said main section having an aperture formed therein and being adapted to be positioned on the underwater bottom; and

secondary sections pivotally affixed to said main section on at least two opposite sides thereof to hang from said main section to be in a substantially vertical position with respect thereto when the drilling sub-base assembly is located in the moon pool so that the drilling sub-base assembly may pass therethrough and said secondary sections in a substantially horizontal position relative to said main section when said drilling sub-base assembly is positioned on the underwater bottom wherein said secondary sections are restrained from moving to a position above the horizontal with respect to said main section so that the necessary foundational base for the carrying-on of drilling operations is provided.

4,273,472

APPARATUS FOR PROTECTING SUBSEA WELLS

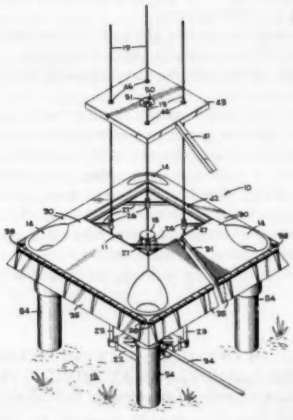
Andre L. Piazza, Houston; Michael J. Krenek, Spring, and Thomas J. Ames, Houston, all of Tex., assignors to FMC Corporation, San Jose, Calif.

Filed Oct. 18, 1978, Ser. No. 952,418

Claims priority, application United Kingdom, Feb. 20, 1978, 6720/78

Int. Cl.³ E02B *17/02;* **E02D** *31/00*

U.S. Cl. 405—211 **5 Claims**



1. Apparatus for protecting subsea structures on the sea floor from physical damage caused by nets, anchors and other marine equipment, said apparatus comprising:

a deflecting structure for mounting over said subsea structures, said deflecting structure including an inclined roof portion, a skirt-like anchor deflector and means for pivotally connecting said anchor deflector to a lower portion of said roof portion, said deflecting structure having an opening in the upper portion thereof for access to said subsea structure;

at least one supporting pile placed in said sea floor to secure said deflecting structure in place;

means for connecting said deflecting structure to said supporting pile; and

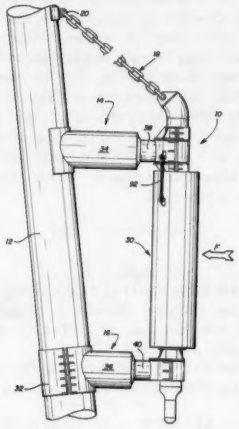
a protective cap for mounting in said opening of said deflecting structure.

4,273,473

SHOCK ABSORBING COLUMN

Clarence Thomerson, and Jay W. Jackson, both of Corsicana, Tex., assignors to Regal Tool & Rubber Co., Inc., Corsicana, Tex.

Filed Mar. 13, 1979, Ser. No. 20,163
Int. Cl.³ E02B *3/22, 17/00;* **B63H** *21/04*
U.S. Cl. 405—212 **18 Claims**



1. In a bumper assembly for use on an offshore structure to provide protection from contact from vessels, said assembly comprising in combination:

(a) a vertically extending elongate contact member having hollow portions adjacent the ends thereof;

(b) at least one support member extending into each of said hollow portions;

(c) at least two axially spaced resilient means coupling said contact member to said support member, one of said resilient means being positioned within each of said hollow portions of said contact member, said resilient means being axially spaced to provide an unsupported length of said contact member between said resilient means;

(d) upper and lower support arms connected to said support member at spaced locations; and

(e) means for attaching said support arms to said structure.

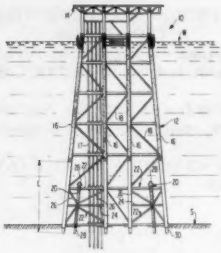
4,273,474

GROUTING OF OFFSHORE JACKETS TO DISTRIBUTE FORCES AMONG THE ANCHORING PILES

Jay B. Weidler, Houston, Tex., assignor to Brown & Root, Inc., Houston, Tex.

Filed May 11, 1979, Ser. No. 38,272
Int. Cl.³ E02B *17/00*
U.S. Cl. 405—225 **12 Claims**

1. In an offshore jacket of the type comprising a plurality of main hollow pile sleeves and a plurality of secondary hollow pile sleeves of shorter height than said main sleeves and connected to said main sleeves by framing, all of said pile sleeves resting on said seabed and extending upwardly therefrom; a plurality of main piles disposed within said main sleeves and projecting downwardly therebeyond into the seabed; a plurality of secondary piles disposed within said secondary sleeves and projecting downwardly therebeyond into said seabed, said main and secondary piles being connected to their respective main and secondary sleeves by grout disposed within an annulus between the sleeve and the pile, so that said piles resist axial forces; the grout within the annulus of each secondary sleeve extends to the seabed; the improvement wherein the grout within at least some of said main sleeves terminates above the seabed to decrease the axial spring value of the associated main



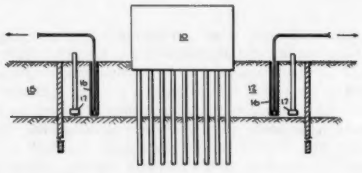
piles and thereby increase the proportion of the axial forces which are borne by said secondary piles.

4,273,475

LOAD SUPPORTING STRUCTURE

Francis M. Fuller, Houston, Tex., assignor to Raymond International Inc., Houston, Tex.

Division of Ser. No. 725,497, Sep. 22, 1976, Pat. No. 4,124,982.
This application May 18, 1978, Ser. No. 907,306
Int. Cl.³ E02D *3/10, 27/00*
U.S. Cl. 405—229 **3 Claims**



1. In a region normally including a stratum of loose water bearing granular soil having liquefaction potential, a load supporting system comprising: load bearing means in said region extending to a depth at least to a load bearing level, endless wall means in said region extending to a depth at least equal to the depth of said stratum to confine that portion of said stratum above a load bearing level and within said wall means and to resist the flow of ground water into said stratum, and water removing means including means within said stratum confined by said endless wall means and extending to a depth near the bottom of the stratum for removing water from within the confines of said wall means substantially to dewater said soil to a degree sufficient to stabilize said soil having liquefaction potential thereby to provide additional support for said load bearing means.

4,273,476

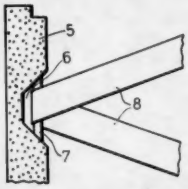
REINFORCEMENT OF ARMORED EARTH WORK CONSTRUCTIONS

Bernhard Kotulla, Cologne; Hans Haas, Hoffnungsthal; Martin Weiser, Cologne; Rolf Förster, Cologne; Lothar Preis, Cologne, and Rudolf Schmidt, Burscheid, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen

Filed Nov. 15, 1978, Ser. No. 960,817
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1977, 2753243
Int. Cl.³ E02D *5/00*
U.S. Cl. 405—258 **18 Claims**

1. A method of reinforcing an armoured earthwork construction comprising the steps of: providing at least one exposed connecting element in the outer skin of at least one building member; impregnating at least one high-strength

corrosion-resistant netted or weaved band with liquid reaction resins, which harden after the band has been embedded in the



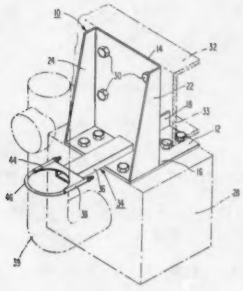
earth; wrapping each band around a connecting element; and embedding the free ends of the band in the earth.

4,273,477

METHOD AND APPARATUS FOR INSTALLING A DRY BULK OFF-LOADING SYSTEM

John T. Murphy, Audubon, Pa., assignor to R & M Associates, Inc., Valley Forge, Pa.

Filed Oct. 3, 1978, Ser. No. 948,382
Int. Cl.³ B65G *53/40*
U.S. Cl. 406—39 **1 Claim**



1. In a system for off-loading dry bulk material from a transporting vehicle, bracket for mounting a blower on a frame member of said vehicle whereby the center of gravity of said blower is beneath said frame member, said blower mounting bracket comprising:

a. a first support member comprising a blower attachment plate having a first surface adapted for mating with said blower and a second surface opposite said first surface;

b. a second support member extending from and substantially perpendicular to said second surface of said first support member, said second support member comprising a frame attachment plate having a first surface adapted for mating with said vehicle frame member and a second surface opposite said first surface;

c. torsion resisting means comprising:

i. first and second side plates extending from and substantially perpendicular to said second surface of said frame attachment plate, one edge of each of said side plates being rigidly attached to said second surface of said blower attachment plate; and

ii. at least one stiffener plate extending from said second surface of said blower attachment plate, one edge thereof being rigidly attached to said first surface of said frame attachment plate; and

d. pipe support means comprising:

i. an elongate pipe support member having a substantially rectangular cross-section, a first end of said pipe support member being rigidly attached to said second surface of said blower attachment plate between said first and second side plates, adjacent said second surface of said frame attachment plate; and

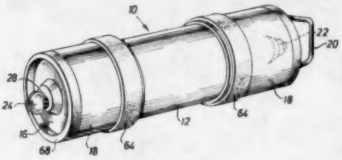
ii. means adapted to engage at least a portion of the periphery of a blower discharge pipe, said means rigidly attached to a second end of said pipe support member opposite said first end.

4,273,478

LOCKING SECURITY CONTAINER

Stig Cedergren, c/o Robsahm, Strindbergsgat. 53, S-115 31 Stockholm, Sweden

Filed Apr. 6, 1978, Ser. No. 893,980
Claims priority, application Sweden, Apr. 12, 1977, 7704195
Int. Cl.³ B65G *51/06*
U.S. Cl. 406—189 **8 Claims**



1. A lockable security container for valuables comprising:

a container including a central body and a closure cap provided on at least one end thereof;

said container including an interal space for positioning valuables;

said internal space being defined between an inner wall of said central body and end walls of said container;

an electrical circuit including a first portion substantially covering the entire inner wall of said central body;

said electrical circuit including a second portion substantially covering the entire end walls of said container;

said first and second portions of said electrical circuit being operatively connected to each other and to a power source;

means for damaging the valuables positioned within said container including a housing positioned within said internal space for containing a dye;

said housing including a plunger interposed between a charge of powder and said dye; and

said charge of powder being operatively connected to said electrical circuit and said power source thereby shortcircuiting said electrical circuit activates said charge of powder to move said plunger against said dye to uniformly spray said internal space and damage said valuables.

4,273,479

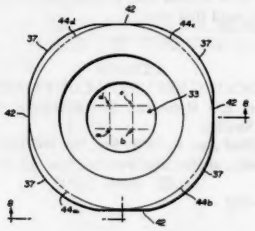
CUTTER ASSEMBLY FOR BROACHING

Arthur J. Raupp, Jr., Milford; Michael N. Gerasin, Drayton Plains, and M. Leonard Thompson, Livonia, all of Mich., assignors to The Valeron Corporation, Troy, Mich.

Filed Nov. 28, 1979, Ser. No. 98,229
Int. Cl.³ B26D *1/12*
U.S. Cl. 407—113 **3 Claims**

1. An indexable cutting insert for a broaching tool, said insert including a center, a top planar surface, a bottom planar surface, and a peripheral surface, said peripheral surface bounding an inscribed circle which has a center coincident with the center of said insert, said peripheral surface including a plurality of flat planar surfaces that are parallel to the longitudinal axis of said insert and a plurality of bulges, said flat planar surfaces being substantially tangent to said inscribed circle and each bulge being defined by a corresponding center of curvature and radius of curvature, the radius of curvature of each bulge being at least four times greater than the distance from the center of curvature of each bulge to the center of said inscribed circle, the top planar surface and bottom planar

surface being substantially perpendicular to the longitudinal axis of said peripheral surface and the intersection of the top planar surface and bottom planar surface with the bulges on



said peripheral surface defining a plurality of cutting edges, and said flat planar surfaces providing an indexing mechanism for said insert whereby said insert may be accurately indexed in multiples of 90°.

4,273,480

THROWAWAY TIP

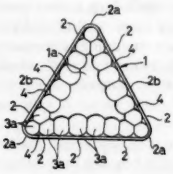
Makoto Shirai; Michinobu Ito, and Osamu Kato, all of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Oct. 16, 1978, Ser. No. 951,816

Claims priority, application Japan, Oct. 17, 1977, 52/138842[U]

Int. Cl.³ B26D *1/00*

U.S. Cl. 407—114 **10 Claims**



1. In a throwaway tip for use in a lathe cutting tool, having a cutting edge formed about the periphery of the tip and a chip breaker groove formed on a surface, the improvement comprising, said breaker groove formed by a plurality of generally spherical recesses disposed adjacent said cutting edge and contacting each other.

4,273,481

HYDRAULIC STOP

John E. Corley, St. Charles; Joseph M. Mitchell, Marthasville, and Charles M. Andert, Florissant, all of Mo., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Dec. 17, 1979, Ser. No. 104,076

Int. Cl.³ B23B *47/24*

U.S. Cl. 408—14 **4 Claims**

1. An automatic hydraulic stop for use with a numerical control machine and drill bit to limit the depth a drill bit penetrates a work piece comprising:

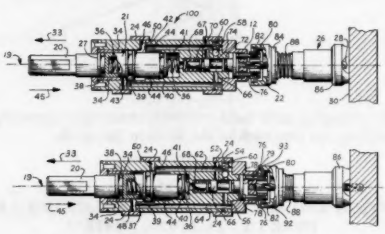
an elongated driver interconnected at its first end to said numerical control machine to rotate about an axis, said driver having a piston on its second end;

a body member surrounding and attached to the piston end of said driver to rotate with said driver about said axis and transmit rotary motion to said drill bit affixed to said body member, said piston end of said driver located in a first cavity within said body member defining first and second chambers, the volumes of said chambers varing proportionally with the location of said piston in said cavity;

hydraulic fluid to fill said first chamber to transmit a force lineally along said axis from said driver to said drill bit;

spring means interconnected between said body member and said driver to bias said piston end of said driver out of said body member lineally along said axis enlarging the volume of said first chamber and decreasing the volume of said second chamber;

first valve means permitting unidirectional flow of hydraulic fluid between said chambers;



second valve means designed to open at a predetermined force permitting the flow of hydraulic fluid in the opposite direction of the first valve means between said chambers, and

sensing means attached to said body member to contact a work piece to be drilled and transmit a predetermined force to said second valve means thereby opening said valve means when the drill bit has penetrated said work piece to the prescribed depth.

4,273,482

AUTOMATIC TOOL-MOVING MACHINE

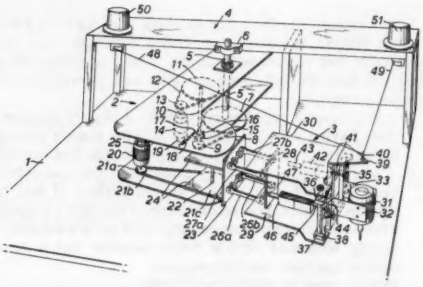
William M. LLoyd, Hartley, and Brian M. Lloyd, Higher Compton, both of England, assignors to Conti-Form Machine Tools Limited, Plymouth, England

Filed Jun. 27, 1979, Ser. No. 52,663

Claims priority, application United Kingdom, Jul. 3, 1978, 28609/78

Int. Cl.³ B23Q *21/00*; G05B *00/00*

U.S. Cl. 409—80 **15 Claims**



1. An automatic machine for effecting required movements of an element over a two-dimensional work area, said machine comprising:

fixed structure,

first support means in the form of a cantilevered arm having inner and outer arm parts respectively articulated to said fixed structure and to said inner arm part,

second support means mounting said element and carried at the free end of said outer arm part in a manner permitting relative movement between said second support means and the outer arm part within predetermined displacement limits whereby to enable the said element to be moved

over a zone of the work area, the location of said zone within the work area being dependent on the instantaneous position of the first support means,

a first servo control loop including first movement means in the form of respective motors for articulating the inner and outer arm parts whereby to enable the second support means and the said element to be displaced over substantially the whole of the work area; first sensing means arranged to generate output signals indicative of the approach of the second support means to a said limit of its displacement relative to the said outer arm part; and first control means for controlling operation of said first movement means in dependence on the output signals of said first sensing means; and

a second servo control loop including second movement means in the form of two linear actuators operative to move the second support means relative to the outer arm part in respective mutually orthogonal directions, the said two linear actuators being arranged such that their respective lines of action are substantially parallel to each other, and the second movement means further including a linkage system effective to transpose the action of the said actuators from their lines of action to said mutually orthogonal directions; second sensing means arranged to generate feedback signals indicative of movement of the said element over the work area relative to the machine fixed structure; storage means for storing demand signals indicative of the required movement of the element relative to said fixed structure; and second control means arranged to receive said feedback and demand signals and being operative in dependence thereon to control the second movement means with a view to causing the latter to effect the said required movement by itself notwithstanding the said limits on the permitted relative movement between the outer arm part and the second support means;

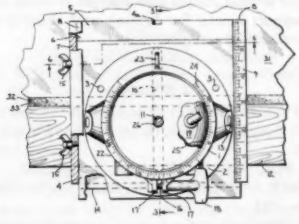
said first servo control loop being responsive to the second support means approaching a said limit of its displacement relative to the outer arm part, to so move the first support means relative to the fixed structure as to contribute to the said required movement of said element sufficiently to prevent the second servo control loop seeking to move the second support means beyond the relevant said displacement limit.

4,273,483

DEGLAZING TOOL

Lyle J. Mendicino, 130 Jefferson St., North Fond du Lac, Wis. 54935

Filed Aug. 6, 1979, Ser. No. 64,009
Int. Cl.³ B27C *5/10*
U.S. Cl. 409—178 **4 Claims**



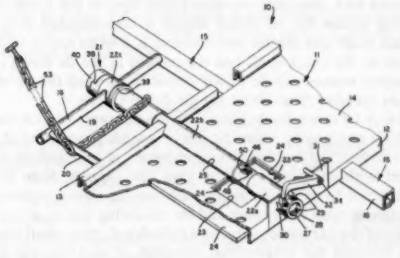
1. A portable deglazing tool for removing glazing compound and glazier points from the inside ledge of window frames while simultaneously refinishing the wood surfaces to which the compound has been applied, which comprises a base disposed to overlie the window frame and having a generally centrally located slot therein extending at right angles to the frame of the window upon which the base of the tool is disposed, guide means located on each side of the base in generally parallel relation to the slot, a sub-base disposed over the base with a central aperture therein in alignment with the slot in the base and adapted to be moved over the base within the guide means, a generally cylindrical housing having an open supporting means at the lower end secured to the sub-base, an electric motor rotatably disposed within the cylindrical housing, a first cooperating indexing means on the supporting means and sub-base which is disposed in predetermined alignment by movement of the sub-base to locate the motor in a selected location longitudinally of the window frame and with respect to the ledge thereof, means to secure the sub-base to the base when the selected alignment of the base and sub-base have been completed and the motor properly located with respect to the ledge, a fluted cutting bit secured at the upper end to the motor within the supporting means and rotated by the motor at a speed of at least 20,000 r.p.m. and adapted to extend through the aperture in the sub-base and the slot in the base to engage the glazing compound on the ledge, and the cylindrical housing being split vertically and having a grooved helical track on the inside, and abutments on the frame of the motor disposed to ride in said track to permit rotation of the motor clockwise or counterclockwise of the motor to locate the motor and cutting bit at various selected heights within the cylindrical housing, the height position of the motor being determined by alignment of a second cooperating indexing means comprising a selected index mark on a rotatable scale on top of the cylindrical housing being aligned with a selected scale mark on the housing of the motor, and a wing nut assembly secured to the two parts of the cylindrical housing and disposed to be tightened to secure the motor within the cylindrical housing in the selected height position to locate the cutting tool over the ledge of the frame at a predetermined depth to then activate the cutting bit and remove the glazing compound and glazing points from the ledge and refinish the wood bordering the ledge without injury to the wood or glass in the event window glass is located on the ledge.

4,273,484

QUICK RELEASE WINCH TIE DOWN AND RAMP ASSEMBLY

Gregory G. Blanar, Marietta, Ga., assignor to Bankhead Enterprises, Inc., Atlanta, Ga.

Filed Jul. 16, 1979, Ser. No. 57,826
Int. Cl.³ B60P *3/06, 7/08;* B61D *45/00;* B66D *1/04*
U.S. Cl. 410—12 **14 Claims**



1. A tie down for car hauler vehicles comprising an outer bearing sleeve for mounting to the ramp of a vehicle, a cylindrical crank shaft extending through said bearing sleeve, a ratchet attached to said crank shaft and a pawl arranged to engage said ratchet to prevent rotation of said ratchet and said crank shaft in one direction while permitting rotation of said crank shaft in the other direction, a release shaft extending through said crank shaft and having one end thereof protruding from said crank shaft, a first lock member mounted on the protruding end of said release shaft, a tie down sleeve extending about said crank shaft and said release shaft and including

a second lock member mounted on one end thereof for engagement with said first lock member, spring means for urging said first lock member into engagement with said second lock member whereby said release shaft and said tie down sleeve are locked together and are rotatable in unison, and connector means for connecting said crank shaft and said release shaft in telescopic relationship for rotation together, a tie down chain means having an end portion thereof connected to said tie down sleeve with its other end portion being connectable to an automobile carried on the ramp, said crank shaft defining an opening therein through which said release shaft can be engaged and moved longitudinally whereby when the tie down chain means is connected to an automobile on the ramp to which the tie down is mounted and the crank shaft is rotated, the release shaft, both lock members, and the tie down sleeve also rotate to wrap the tie down chain means about the tie down sleeve and effectively shorten the tie down chain means and urge the automobile to which the tie down chain means is connected toward the ramp, and when the release shaft is moved longitudinally with respect to the crank shaft the lock members disengage and the tie down sleeve is free to rotate about the crank shaft and the release shaft so that tension in the tie down chain means causes the tie down sleeve to rotate an unreel and tie down chain means from about the tie down sleeve.

6. A ramp assembly for a car hauler vehicle including in combination a pair of spaced parallel tracks for supporting the wheels of a car, the combination therewith of each track including at lest one tie down assembly for holding the car on the ramp assembly, each of said tie down assemblies comprising an outer bearing sleeve mounted to its track, a crank shaft rotatably received in said bearing sleeve, retaining means for preventing rotation of said crank shaft in one direction while permitting rotation of said crank shaft in the other direction, a tie down sleeve rotatable about said crank shaft, a release shaft positioned within said tie down sleeve and telescopically connected to said crank shaft for rotation with said crankshaft, a first lock member mounted on said release shaft, a second lock member mounted on said tie down sleeve, spring means biasing said first and second lock members toward locked engagement with each other, means for releasing said tie down sleeve from said crank shaft, and a tie down chain member connected at one of its end portions to said tie down sleeve, whereby when the first and second lock members are locked together and when the tie down chain member is connected to a car on the ramp and the crank shaft is rotated the tie down sleeve also rotates and winds the tie down chain member about the tie down sleeve and effectively shortens the tie down chain member to urge the car toward the ramp, and when the first and second lock members are disengaged against the force of the spring means the tie down sleeve is disconnected from the crank shaft and the tie down sleeve is free to rotate with respect to the crank shaft and the tension in the tie down chain member rotates the tie down sleeve to unwind the tie down chain member from about the tie down sleeve.

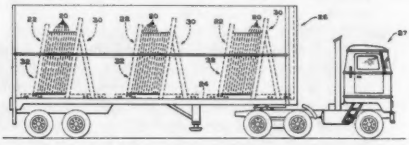
14. A tie down for holding a car on the ramp of a car hauler vehicle comprising a bearing sleeve assembly including at least two cylindrical bearing sleeve segments in longitudinal alignment with each other and at least one support plate rigidly connected to and maintaining said bearing sleeve segments in alignment with each other and for mounting the tie down to a ramp of the car hauler vehicle, a cylindrical crank shaft extending through the longitudinal openings of said bearing sleeve segments and rotatable with respect to said bearing sleeve segments, a ratchet and pawl means for preventing rotation of said crank shaft in one direction of rotation with respect to said bearing sleeve segments and allowing rotation of said crank shaft in the other direction of rotation with respect to said bearing sleeve segments, a tie down sleeve positioned coaxially about said crank shaft and positioned in a space between said bearing sleeve segments and rotatable with respect to said crank shaft, releasable lock means for releasably connecting said crank shaft and said tie down element, said releasable lock means comprising a release shaft positioned in said crank shaft and movable along the length of said crank shaft for rotation with said crank shaft and including an end portion protruding from an end of said crank shaft, a first lock element at the protruding end of said release shaft, and tie down sleeve including a second lock element, spring means arranged to urge said release shaft along its length until said lock elements are in locking engagement with each other so that said tie down sleeve and said crank shaft are locked together, said crank shaft defining an opening in its side portion at a position between bearing sleeve elements which exposes said release shaft to the outside of the tie down for engagement by an actuating tool, a tie down chain member having one end portion connected to said tie down element and the other end free for connection to a car on the ramp of the car hauler, whereby when the releasable lock means is connected between said crank shaft and said tie down element and the crank shaft is rotated the tie down sleeve rotates in unison therewith to reel the tie down chain member about the tie down sleeve, and when the releasable lock means is disconnected between said crank shaft and said tie down sleeve the tie down sleeve is independently rotatable with respect to said crank shaft and said bearing sleeve elements and any tension applied to the tie down chain member rotates said tie down sleeve and unreels the tie down chain member from about the tie down sleeve.

4,273,485

SEMI-TRAILER SHIPPING SUPPORT STRUCTURE

Wolfgang Fischer, Carlisle, and William J. Brown, Lower Burrell, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 7, 1978, Ser. No. 931,709
Int. Cl.[3] **B60P** *7/10;* **B61D** *3/16, 45/00*
U.S. Cl. 410—34 **14 Claims**



1. A front restraint for a rack for shipping articles on a vehicle, wherein the rack is of the type having a pair of spaced elongated runners, each of the runners having a horizontal supporting surface and an opposite second surface; back support means; and means for mounting the back support means on the runners, comprising:

at least one upright having a first end and a second end;

means for slidably mounting the first end of said upright on the supporting surface of one of the runners; and

means engaging the opposite second surface of the runner when the second end of said upright is tilted toward the back support means for locking said slidably mounting means on said one of said runners.

4,273,486

WINCH AND CHAIN ATTACHMENT ASSEMBLY

Richard A. Tatina, Bridgeview, Ill., assignor to Portec, Inc., Oak Brook, Ill.

Filed May 31, 1977, Ser. No. 801,621
Int. Cl.[3] **B60P** *7/08;* **B61D** *45/00;* **B65D** *63/00;* **B66D** *1/00*
U.S. Cl. 410—103 **5 Claims**

1. In a tie-down winch for tying cargo to the deck of a flat deck transporting vehicle,

at least one channel extending longitudinally along the deck of the vehicle and having a web,

parallel spaced side walls extending upwardly of said web,

retainer flanges extending inwardly of said side walls,

a tie-down winch carried in said channel and including a base frame having a bottom wall supported on the web of said channel for adjustable movement therealong and

having parallel spaced side walls and a top wall, said top, bottom and side walls being integrally formed,

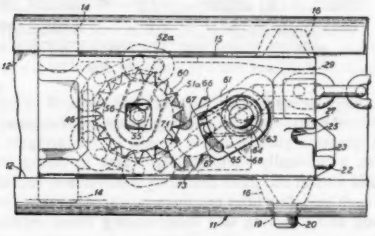
at least one locking member carried by said base frame for movement relative to said base frame into interengagement with said channel to hold said base frame in position in said channel,

a tie-down chain having horizontal and vertical links connected together and adapted to be connected to cargo on said flat deck,

a vertical axis winch block mounted on said base frame between the top and bottom walls thereof and journalled in said top and bottom walls for take-up movement relative to said base frame,

a ratchet having interengagement with said winch block,

a pawl pivoted on said top wall of said base and having pawl teeth positionable to engage said ratchet and accommodate rotation of said ratchet and winch block in chain take-up increments and to hold said winch block from rotation as tension is taken up on said chain, and



spring means resiliently retaining said pawl teeth in engagement with said ratchet,

the improvement comprising,

an upwardly opening chain pocket recessed in said winch block for an end horizontal link of a tie-down chain and a depending recessed portion extending from said chain pocket to the periphery of said winch block and forming a partial chain pocket for a next adjacent vertical link of said tie-down chain,

said ratchet having a depending boss having interengagement with said block and having a vertically extending chain pocket registering with and completing said partial chain pocket in said winch block to receive a next adjacent vertical link of said tie-down chain and complete said partial chain pocket, and

means accessible from the top of said winch for retaining said ratchet to said winch block and said tie-down chain to the chain pocket formed by said winch block and boss.

4,273,487

CARGO TIE-DOWN ANCHOR

Richard E. McLennan, Rancho Palos Verdes, Calif., assignor to Satron, Inc., El Segundo, Calif.

Filed Jun. 13, 1979, Ser. No. 47,989

Int. Cl.[3] **B60P** *7/08;* **B61D** *45/00*

U.S. Cl. 410—105 **12 Claims**

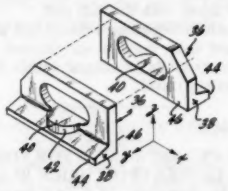
1. An end fitting for cargo tiedown gear for connecting the cargo tiedown gear to a tiedown track wherein the track includes having a pair of spaced undercut longitudinally-extending flanges, a longitudinally-extending hollow space of uniform reentrant lateral cross section defined beneath the flanges and within the track, the hollow space having a uniform width in the lateral direction, said flanges including edges which face each other, the edges including opposite straight portions alternating along the edge with opposing concave portions in a periodic sequence, said end fitting being of the butterfly type wherein two halves of the end fitting are juxtaposed at a position along the track and are inserted into the track by simultaneously pivoting the halves in opposite senses about longitudinal axes, said end fitting comprising:

two halves, each half being a rigid unitary structure extending in longitudinal and lateral directions that are aligned with the longitudinal and lateral directions of the track when the halves have been inserted into the track, and extending in a vertical direction that is orthogonal to the longitudinal and lateral directions, each half comprising:

a foot having a toe, a heel and sole, said foot thin enough in the vertical direction to permit the toe to extend into the undercut space beneath one of the flanges of the track to prevent the half from being pulled vertically out of the track;

said toe being thinner in a vertical direction than the remainder of said foot;

a back plate extending longitudinally and extending vertically from the heel of the foot far enough to extend outward and beyond the flanges when the half has been inserted in the track, the thickness of said back plate in the



lateral direction being greater than the thickness of the foot in the vertical direction, the thickness of said back plate being less than half the lateral spacing between the straight portions of the edges of the flanges of the track by an amount of clearance adequate to permit the halves to be pivoted into the track but sufficiently small that after the halves have been inserted into the track, lateral motion of the end fitting within the track is limited by the straight portions of the edges of the flanges of the track;

a land elevated vertically above said foot and supported by a pedestal extending vertically from said foot, said pedestal extending laterally toward the toe of the foot far enough to engage one of the concave portions of the edge of a flange of the track when said half has been inserted into the track, to limit movement of said half longitudinally along the track; and,

each of said two halves including means for securing to said two halves cargo tiedown gear when said two halves are inserted in said track.

4,273,488

BALE STACKING WAGON

Amos G. Hill, and Fenton J. Harder, both of Hesston, Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Jun. 5, 1978, Ser. No. 912,441

Int. Cl.[3] **A01D** *87/12;* **B65G** *57/30, 57/32*

U.S. Cl. 414—44 **44 Claims**

1. In a mobile machine for building a multilayer stack of crop bales, the improvement comprising:

a generally horizontally disposed bed supported above the ground for travel across a field having a number of bales lying thereon;

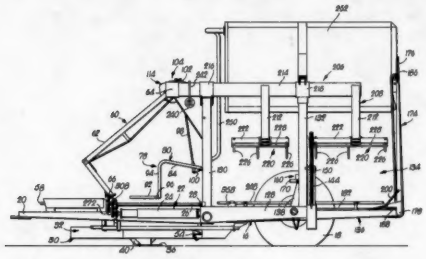
apparatus for picking up said bales, elevating the same to said bed, and forming one layer at a time on the bed from the picked up and elevated bales;

means for vertically reciprocating said bed between, and selectively holding the same at, any one of a number of vertical positions including a layer-forming position and an overhead, layer-transferring position;

structure for successively receiving layers from said bed in said layer-transferring position of the latter and for retain-

ing the same, together with any layers above the retained layer, in spaced disposition above the bed so as to progressively form an upright stack from the bottom up from the layers presented by the bed,

said structure including selectively releasable means operable when released to permit retrograde, lowering movement of layers with the bed; and



mechanism for off-loading a completed stack from said bed while said stack remains upright and while the bed remains substantially horizontal within its path of vertical, reciprocating travel.

4,273,489

PROCESS AND APPARATUS FOR FORMING OF SET LAYERS FROM BRICK BLANKS

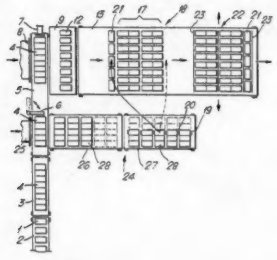
Hans Lingl, Jr., Neu-Ulm, and Josef Schwarz, Vöhringen, both of Fed. Rep. of Germany, assignors to Lingl Corporation, Paris, Tenn.

Filed Dec. 26, 1978, Ser. No. 972,718

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1977, 2758648

Int. Cl.³ B65G *57/26*

U.S. Cl. 414—60 **25 Claims**



1. A method of forming a layer of green bricks, in which layer rows of the bricks can have the same or differing orientations, which method comprises conveying using first conveyor means bricks in a row, adjacent bricks being near to or in contact with each other, the row being transferred to a displacement device arranged to receive a row from the first conveyor means, bricks of the row being spaced apart from each other longitudinally of the row by the displacement device, transferring the separated rows to second conveyor means transversely of the longitudinal axis of the row to form on the second conveyor means a layer or partial layer, transferring, to supplement the partial layer if required, further bricks in a row from the first conveyor means to a preparatory device comprising third conveyor means, adjacent bricks of the further row being near to or in contact with each other, the third conveyor means conveying the further row transversely of the longitudinal axis of the further row and substantially parallel to the direction of conveyance of the rows on the second conveyor means to form a preparatory layer, transferring, using first transfer gripper means, the preparatory layer or a row from the preparatory layer with simultaneous rotation through 90° to the second conveyor means to supplement the partial layer and transferring, using second transfer gripper means, the layer from the second conveyor means.

4,273,490

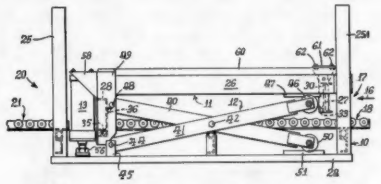
STACKING APPARATUS

Raymond E. James, Chicago, Ill., assignor to Palletron Incorporated, Schiller Park, Ill.

Filed Oct. 4, 1979, Ser. No. 81,768

Int. Cl.³ B65G *57/30*

U.S. Cl. 414—95 **7 Claims**



1. Apparatus for forming a vertical stack of pallets being delivered horizontally comprising: means receiving said pallets in a direction parallel to the length of the stringers of said pallet; a vertically reciprocating frame including first and second pivotal end gates extending transverse of said stringers and each including lifter members; power means for selectively raising and lowering said reciprocating frame relative to a pallet received in said apparatus; and actuating means for swinging said gates outwardly of a pallet received in said apparatus when said reciprocating frame is lowered to a position at which the weight of a partial stack held by said reciprocating frame is transferred to a newly received pallet, said actuating means further swinging said gates to a lifting position when said frame is fully lowered.

4,273,491

DEVICE FOR STORAGE OF FLAT OBJECTS

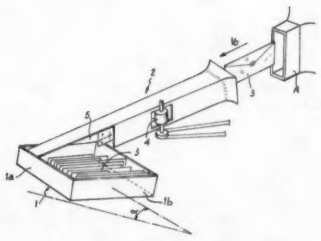
Jacques Roux, Paris, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Apr. 14, 1978, Ser. No. 896,485

Claims priority, application France, Apr. 18, 1977, 77 11561

Int. Cl.³ B65G *57/00*

U.S. Cl. 414—109 **16 Claims**



1. In a device for forming and storing a stack of flat objects each having a plurality of edges, in a box open on one face, closed on the opposite face, and having a plurality of additional faces extending between said opposite and open faces to define sides, said flat objects being stacked substantially perpendicularly to said opposite face and against one of said sides defining a stacking surface, said objects arriving individually from a

processing device in a substantially vertical plane substantially perpendicular to said opposite face and an adjacent side, and remote from said stacking surface and at a certain speed, the improvement comprising:

said box being positioned with respect to said processing device so that objects arrive along a path of travel forming an acute angle with said opposite face;

a stop situated substantially in the plane of said adjacent side of the box and positioned to receive the impact of part of the leading edge of an arriving object, said stop acting on said object to create a couple of rotation in its plane, so that an edge of said object directed towards said opposite face and defining a lower edge is urged against the opposite face of the box; and

said processing device being situated at a sufficient height with respect to said opposite face so that each flat object, as soon as its lower edge is resting on said opposite face retains its perpendicular orientation thereto and moves against the stack already formed.

4,273,492

CHARGING DEVICE FOR SHAFT FURNACES

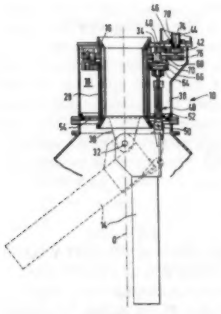
Edouard Legille, Luxembourg, and Pierre Mailliet, Howald, both of Luxembourg, assignors to Paul Wurth, S.A., Luxembourg

Filed Aug. 9, 1979, Ser. No. 65,289

Claims priority, application Luxembourg, Aug. 16, 1978, 80112

Int. Cl.³ C21B 7/16

U.S. Cl. 414—160 **15 Claims**



1. An improved charging device for furnaces of the type having a tubular feed channel which directs charge material delivered thereto under the influence of gravity onto a first end of a steerable charge distribution chute, the feed channel having an axis and being circumscribed by a portion of the furnace wall, the improved charging device comprising:

ferrule means, said ferrule means being coaxial with the feed channel, said ferrule means cooperating with the furnace wall portion which circumscribes the feed channel to define an actuator chamber therebetween;

mounting means positioned in said actuator chamber for supporting said ferrule means from the furnace wall, said mounting means including bearing means for permitting rotation of said ferrule means with respect to the furnace wall about the feed channel axis, said bearing means comprising a bearing block affixed to said ferrule means;

heat shield means affixed to said ferrule means, said heat shield means extending outwardly from said ferrule means toward the said furnace wall portion and defining the lower end of the actuator chamber;

means pivotally supporting the distribution chute from said ferrule means whereby the chute will rotate with said ferrule means, said supporting means positioning the chute such that the receiving end thereof is beneath the feed channel;

telescopic control rod means, said control rod means being pivotally connected at a first end to the distribution chute, said control rod means extending through said heat shield means into the actuator chamber, said control rod means including relatively rotatable upper and lower elements, said lower element being articulated to the chute;

first drive means for imparting rotation to said ferrule means, said first drive means being in part positioned in said actuator chamber and being operatively connected to said mounting means bearing means bearing block;

second rotation imparting drive means, said second drive means being in part positioned in said actuator chamber; and

means coupling said second drive means to said control rod means upper element to cause rotation thereof to thereby vary the length of said control rod means whereby the distribution chute will pivot on said support means, said second drive means being operable independently of said first drive means, said coupling means being rotatably supported from said mounting means bearing means bearing block.

4,273,493

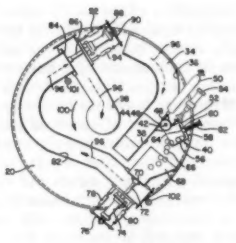
ROTARY FURNACE VOLUMETRIC FEEDER WITH SEALED CHUTE

William I. Bayly, Livingston; Louis J. Rumbolo, Toms River; Ernest E. Fazekas, and Frank Korzeb, both of Westfield, all of N.J., assignors to American Gas Furnace Company, Elizabeth, N.J.

Filed Dec. 11, 1978, Ser. No. 968,579

Int. Cl.³ F27B 7/32

U.S. Cl. 414—221 **5 Claims**

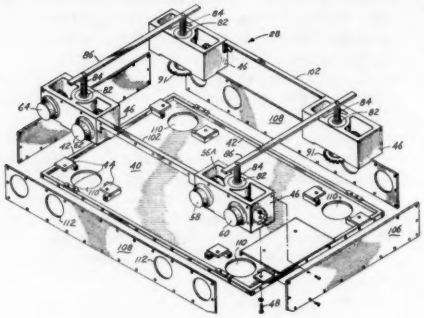


1. A volumetric feeder for a rotary furnace, comprising a measuring station; discharging means for discharging workpieces into the furnace; a discharge chute communicating with said measuring station and said discharging means; first gate means disposed at one end of said discharge chute proximate said measuring station and timed to open and receive workpieces at a particular point in a rotary cycle of the furnace; second gate means disposed at the other end of said discharge chute proximate said discharging means, said second gate means opening at another time in said rotary cycle of the furnace after said first gate means to permit workpieces to be discharged by gravity from said discharge chute into said discharging means; and purging means for purging outside air from said discharge chute, said purging means including supplying means communicating with said discharge chute proximate said discharging means for supplying a protective atmosphere to said discharge chute and exhausting means communicating with said discharge chute proximate said measuring station for exhausting outside air from said discharge chute in response to the supply of protective atmosphere to said discharge chute by said supplying means.

4,273,494
STORAGE RACK ENTRY VEHICLE

James C. Swain; John D. Dickson, both of Columbus, and Larry E. Schluer, Sugar Grove, all of Ohio, assignors to Interlake, Inc., Oak Brook, Ill.

Filed Sep. 27, 1978, Ser. No. 946,152
Int. Cl.[3] B65G 65/00; B66B 9/20
U.S. Cl. 414—266 7 Claims



1. A vehicle for transporting loads of substantial weight and adapted to operate on a surface comprising:

a substantially continuous rectangular flexible plate means having a major planar area substantially horizontal and parallel to said surface,

a plurality of rigid box means mounted directly upon and supported by said plate means adjacent each corner thereof,

transport means mounted on each of said rigid box means and supporting the vehicle for movement upon said surface,

means for supporting a load on the vehicle including elevation changing means for changing the elevation of the load on the vehicle, means mounting said elevation changing means on each of said rigid box means,

said plate means being sufficiently flexible to flex due to the weight of the vehicle and the load thereon to effect vertical movement of ones of said rigid box means and their respective transport means and elevation changing means independently of other ones of said rigid box means and their respective transport means and elevation changing means to permit said transport means to move toward and remain in continuous contact with said surface upon which said transport means move when a portion of the surface upon which a given one of said transport means is in contact varies in elevation from other portions of the surface upon which the other of said transport means are in contact.

4,273,495
APPARATUS AND METHOD FOR LAYING COMPOST IN A MUSHROOM BED

Robert T. Pannell, Kennett Square, Pa., assignor to Pannell Manufacturing Corporation, Avondale, Pa.

Filed Jul. 23, 1979, Ser. No. 59,580
Int. Cl.[3] A01G 1/04; B65B 1/30
U.S. Cl. 414—272 4 Claims

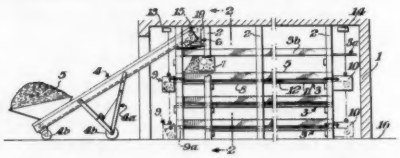
1. Apparatus for depositing a uniformly thick and uniformly dense layer of compost along the entire length and width of a shelf in a mushroom growing house, which apparatus comprises:

(a) a supply elevator conveyer which supplies compost into said mushroom house to a location near one end thereof, the supply end of said shelf; and

(b) a transverse, variable speed, reversible belt conveyer capable of being driven at variable speeds and in reversible directions, said transverse conveyer being located above and adjacent said shelf in close proximity to said supply end thereof, and being capable of receiving compost from said supply elevator and distributing compost into and across said shelf at the supply end thereof onto

(c) a moving web, which web moves along the bottom of said shelf in a direction from the supply end thereof toward the far end thereof, and which web receives said compost distributed onto it by said transverse conveyer at the supply end of the shelf and carries the compost toward the far end of the shelf; and

(d) a fixed, rotating leveling member having rotatable elements located above said shelf in close proximity to the supply end thereof, said elements extending over the entire width of the bed, being prepared and being positioned above the shelf such that on rotation said elements pass over the compost at a desired height from the floor of

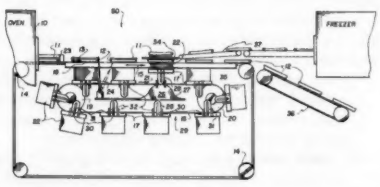


the shelf contacting only compost beyond said height and throwing it upwardly and back into the area initially receiving material, thereby preventing any substantial carryover of compost downstream and thereby leveling the compost to a desired and uniform thickness as the compost passes under said leveling member, whereby, as compost is being supplied, the supply conveyer, the transverse conveyer, the moving web and the leveling member all act cooperatively to form a mushroom bed having compost out a uniform depth along the entire length and width of said bed, said rotatable elements comprising blades of an open type construction comprising an outer member extending parallel to the axle rotating said elements and struts perpendicular to said outer member and connecting said outer member to said axle, thereby providing open spaces between said struts.

4,273,496
DEVICE FOR DEPANNING FRESHLY BAKED PIZZA OR OTHER BAKED GOODS

Gregory C. Papalexis, Cambridge Way, Alpine, N.J. 07620

Filed Jul. 25, 1979, Ser. No. 60,640
Int. Cl.[3] B65G 59/00
U.S. Cl. 414—417 11 Claims



1. A device for depanning freshly baked goods having a crust soon after they leave an oven and before the crust softens comprising:

a pan conveyor adapted to extend from the oven;

baking pans having a plurality of perforations therethrough disposed on said pan conveyor and moveable thereby in a feed path from the ovens, each pan adapted to carry a baked good having a crust, from the oven;

a pin-block conveyor associated with said pan conveyor;

spaced pin-blocks connected to said pin-block conveyor and moveable thereby into the vicinity of said feed path;

means for spacing said baking-pans equal to the spacing between adjacent pin-blocks;

a plurality of pins extending from each pin-block in a pattern and number corresponding to that of said perforations on said baking pan and each of a diameter at most smaller than that of each of said perforations;

a guide means associated with said pan conveyor and pin-block conveyor for guiding said baking pan on said pan conveyor to bring said perforations into alignment with said pins;

hold down means extending parallel to said pan conveyor for holding down said baking pans while allowing conveying of said baking pans and during vertical movement of said pin-blocks;

pin raising means associated with said pin-block for raising said plurality of pins at a location spaced from the oven after said perforations are brought into alignment with said pins, to extend said pins through said perforations and into contact with the crust in said pan thereby lifting the baked good in said baking pan and separating it therefrom before the crust softens; and,

means associated with said pin-block for removing the baked good from said pins.

4,273,497

REFUSE STORAGE AND DISCHARGE APPARATUS

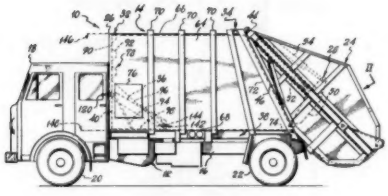
Barrie E. Mealing, and Roderick A. Scott, both of Warwick, England, assignors to Hestair Eagle Limited, Warwick, England

Filed Jun. 13, 1979, Ser. No. 48,314

Claims priority, application United Kingdom, Jun. 26, 1978, 27914/78

Int. Cl.³ B65F *3/28*

U.S. Cl. 414—517 **4 Claims**



1. Refuse storage and discharge apparatus comprising a refuse container having a discharge end and a non-discharge end, an upright refuse pushing member to push refuse out of the discharge end of the refuse container, said refuse pushing member being mounted in the refuse container for movement lengthwise of the container, a support frame positioned below the refuse container and extending lengthwise of the refuse container, a cantilever secured to the support frame at the non discharge end of the refuse container, said cantilever extending upwards from the support frame and forming a rigid load-resisting structure therewith, said refuse pushing member comprising a substantially vertical upper wall portion from the lower edge of which a lower portion slopes downwards and towards the discharge end of said refuse container, said lower portion being constructed so as to overlie at least part of the cantilever when the refuse pushing member is at the non discharge end of the refuse container, and a hydraulic refuse pushing ram connected between the upper end of said cantilever and a lower portion of the refuse pushing member, the ram extending downwardly from the cantilever and towards the discharge end of the refuse container, the position of the connection between the ram and the cantilever being not higher than halfway between the top and the bottom of said refuse pushing member, said upper wall portion of the refuse pushing member being located substantially directly above said connection when the refuse pushing ram is fully retracted.

4,273,498

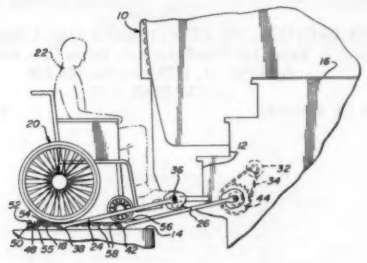
RAILWAY CAR TRAP DOOR LIFT

William W. Dickhart, III, Fort Washington, and Richard H. Marvin, Philadelphia, both of Pa., assignors to The Budd Company, Troy, Mich.

Filed Nov. 7, 1979, Ser. No. 92,439

Int. Cl.³ B60P *1/44, 3/06;* **B61D** *1/44, 3/06*

U.S. Cl. 414—556 **9 Claims**



1. In combination with a railway car having steps leading from a lower level outside of the railway car to a higher level inside the railway car,

(a) a movable platform connected to said car having stationary means for securing and positioning a wheeled vehicle thereon against rolling movement in both directions;

(b) means for moving said platform over said steps between said lower and higher levels, and

(c) means for maintaining said platform in a horizontal position as it is moved from said lower level to said higher level.

4,273,499

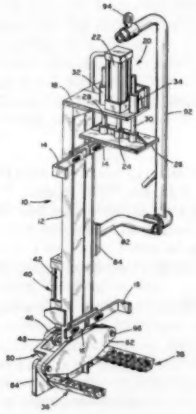
APPARATUS FOR MANIPULATING SIGNATURE BUNDLES

Peter Berko, Royal Oak, Mich., assignor to D. W. Zimmerman Mfg., Inc., Madison Heights, Mich.

Filed Aug. 3, 1979, Ser. No. 63,209

Int. Cl.³ B65G *7/00;* **B66C** *1/44*

U.S. Cl. 414—626 **8 Claims**



1. Apparatus for handling signature bundles comprising an elongate frame member, clamping means carried by one end of said frame member for engaging and releasing an end of a signature bundle, two pivotable arms, said pivotable arms

including an upper row of rollers for engaging the other end of the signature bundle, said pivotable arms also including a lower row of rollers for engaging an upper end of another signature bundle, means pivotally connecting said arms to the other end of said frame member, and moving means connected to said pivotal connecting means for moving said pivotable arms between a position for engaging the other end of the signature bundle and a position clear of the signature bundle.

4,273,500

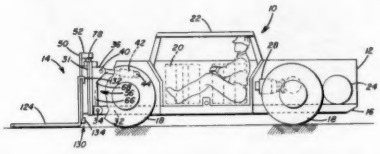
LOW PROFILE LIFT ATTACHMENT FOR A FORKLIFT

George A. Yates, 111 Woodlawn Ave., Grove City, Ohio 43123

Filed Sep. 11, 1978, Ser. No. 941,229

Int. Cl.³ B66B *9/20*

U.S. Cl. 414—642 **11 Claims**



8. A forklift assembly comprising,

a mounting plate having an intermediate portion positioned between and rearwardly of a pair of end portions,

a forklift unit positioned forwardly of said mounting plate with said pair of end portions being positioned closer to said forklift unit than said intermediate portion,

a piston cylinder assembly secured to said mounting plate intermediate portion,

a piston rod operable to extend and retract relative to the upper end of said piston cylinder assembly,

said forklift unit having a rearwardly extending attachment lug with a bore therethrough for receiving the upper end of said piston rod,

said piston rod having a shoulder portion adjacent the upper end thereof for supporting said attachment lug,

said attachment lug bore having a diameter greater than the diameter of the upper end of the piston rod so that said attachment lug is movable relative to the piston rod to assist in preventing the torsional forces carried by said forklift unit from being transferred to said piston rod and said piston cylinder assembly, and

connecting means for connecting the end of said piston rod to said forklift unit so that said attachment lug is movable on said piston rod shoulder portion and upon actuation of said piston cylinder assembly said piston rod is operable to extend and retract to thereby vertically raise and lower said forklift unit relative to said mounting plate.

4,273,501

ROLL HANDLING DEVICE

Melvin D. Terry, P.O. Box 7174, Seattle, Wash. 98133

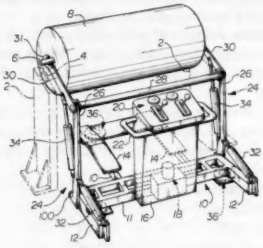
Filed Oct. 23, 1978, Ser. No. 953,914

Int. Cl.³ B66C *23/00*

U.S. Cl. 414—680 **5 Claims**

1. A device for handling rolls of paper or the like, comprising:

main framework means supporting the necessary equipment and controls, said main framework supported by a fluid bearings, a pair of outwardly extending parallel ramp members, each supported by at least one fluid bearing, a pair of articulated arms pivotably secured to the main framework and extending outwardly in a direction generally parallel to the ramp members, said arms including a first section pivotably secured to the frame at opposite sides thereof and extending generally outwardly and upwardly, a second section having a first end pivotably secured to the first section and extending generally outwardly and downwardly to terminate in a material handling second end said arms movable from an extended or reach position to a retracted position and to an upward or lift position, means for selectively moving the arms to the



various positions, and means limiting vertical movement of the second end to a plane substantially above and including the center of gravity of the device, whereby the device lifts only when in a stable position.

4,273,502

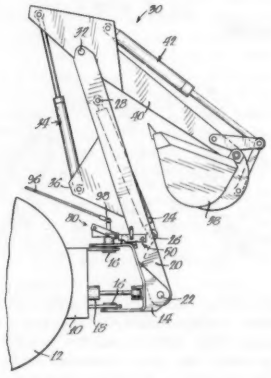
BOOM LOCK MEANS

Herman J. Maurer, and Wayne G. Smith, both of Burlington, Iowa, assignors to J. I. Case Company, Racine, Wis.

Filed Mar. 16, 1979, Ser. No. 21,265

Int. Cl.³ E02F *3/32*

U.S. Cl. 414—694 **6 Claims**



1. In a vehicle having a operator's station and an implement frame supported thereon with a boom pivoted on said frame and movable between transport and working positions, and releaseable latch means for locking said boom in said transport position on same said frame, said releaseable latch means comprising: pin means fixed to said frame at a location horizontally spaced from the pivot for said boom; a generally U-shaped latch having a pair of legs extending from a bite portion with said legs pivoted on said boom about a generally horizontal pivot axis spaced from the pivot for said boom and disposed towards said pin means such that said bite portion and legs cooperate to define a open space for receiving said pin means when said boom is in its transport position; biasing means, linking said boom with said latch, for normally maintaining said latch in a first position where said pin means is received within said open space when said boom in its transport position and for accommodating movement to a second position under the influence of said said pin means while said boom is moving to said transport position and for returning said latch to said first position when said open space is aligned with said pin

means; unlatching means, fixed to said frame, for pivoting said latch from said first position to said second position, said unlatching means including a first element secured to said implement frame, a second element pivoted on said first element, and means, between said first and said second elements, for normally maintaining said second element in a first position, said second element and said latch having overlapping portions adapted to engage each other when said second element is in its first position and said latch is in its first position; and a control member connected to said second element and extending to said operator's station for pivoting said second element from said first position to its second position, whereby

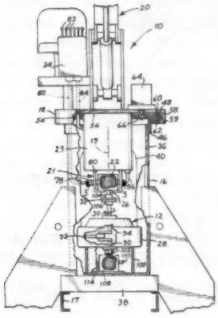
with said boom raised to its transport position and with said latch and said second element in their first positions, said latch is freed from said pin means through the operation of said control member by pivoting said latch to said second position whereupon said boom is free to pivot away from said transport position to a working position.

4,273,503

PRESSURE-FLUID SUPPLY SYSTEM

Tony R. Damron, 37923 Shenandoah Lp., Springfield, Oreg. 97477

Filed Oct. 1, 1979, Ser. No. 80,708
Int. Cl.³ E02F 9/22
U.S. Cl. 414—694 **6 Claims**



1. A pressure fluid supply system for use in combination with a pair of relatively rotatable structures where one structure is intended to carry fluid-operated equipment intended to be operated by said system, said system in operative condition comprising,

self-contained fluid supply and exhaust apparatus operatively connectable with said fluid-operated equipment and including a pump unit having a stator portion anchored to said one structure and a power-driveable rotor portion rotatably mounted with respect to said stator portion,

power-operated prime mover means including a stator portion anchored to the other structure, and a power-outputable rotor portion rotatably mounted with respect to the prime mover means' stator portion, and

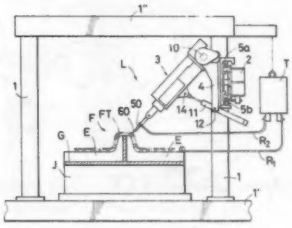
means drivingly coupling said two rotor portions.

4,273,504

INDUSTRIAL ROBOT SYSTEM CAPABLE OF PRESSURE APPLIED MACHINING OPERATIONS

Hirokazu Shimatake, Yamato; Kenzo Natsume, Zama; Takeshi Kojima, Saitama; Shuichi Ogawa, Tokyo; Ryuichi Nara, Tokyo; Shigeru Uchida, Tokyo, and Haruyoshi Takagishi, Yamato, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 21, 1979, Ser. No. 41,068
Claims priority, application Japan, May 22, 1978, 53-60727
Int. Cl.³ B25J 9/00
U.S. Cl. 414—728 **5 Claims**



1. An industrial robot system comprising:

a pair of vertically spaced parallel upper and lower guide rails;

means for supporting said guide rails a distance from the ground;

a slide member mounted slidably on said guide rails;

means for moving said slide member along said guide rails;

a robot arm structure having a housing pivotally mounted at an upper end portion thereof on an upper pivot point of said slide member adjacent to said upper guide rail, an outer cylindrical shaft mounted movably in said housing along the longitudinal axis thereof, an inner shaft mounted in said outer shaft and rotatable about said longitudinal axis and axially movable with said outer shaft, first fluid operated telescopic means secured to said housing for axially moving said outer and inner shafts, second fluid operated means for rotating said inner shaft, and a tool holding wrist portion for holding a tool, said wrist portion being axially movable with the axial movement of said outer and inner shafts and vertically swingable with the rotation of said inner shaft; and

third fluid operated telescopic means pivotally connected between a lower pivot point of said slide member adjacent to said lower guide rail and a lower end portion of said housing for pivoting said robot arm structure at a desired angular position.

4,273,505

PNEUMATIC INFLATABLE END EFFECTOR

Keith H. Clark, Decatur, and James D. Johnston, Madison, both of Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 22, 1978, Ser. No. 945,044
Int. Cl.³ B25J 3/00
U.S. Cl. 414—735 **5 Claims**

1. In the combination of a remote controlled manipulator arm and an end-effector device of the type used on space vehicles and the like for carrying out maneuvers by inserting said end-effector device into an opening in an object being grasped, wherein said end-effector device comprises:

a tubular member;

means for adapting said tubular member to said manipulator arm;

inflatable balloon means carried by one end of said tubular

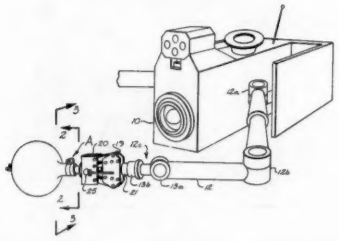
member expandable into a general shape for occupying said opening of said object;

a hollow bore formed within said tubular member;

means for connecting said hollow bore to a source of pressurized fluid;

an elongated spine member carried by said tubular member in a cantilevered manner extending past said one end of said tubular member and having a distal end attached to said balloon means affording rigidity to said balloon means when inflated and during manipulation of said object;

said spine member being slidably carried by said tubular member to variably project and retract relative to said



tubular member for accomodating the inflation and deflation of said balloon means;

reinforcing means carried in contact with a base portion of said balloon means for stiffening said base portion when inflated affording reinforcement under load to provide a degree of rigidity to said balloon means when undergoing motion about the axis of said tubular member;

a central bore formed in said spine member communicating with said hollow bore of said tubular member; and

a plurality of openings formed in the exterior of said spine member communicating said central bore with the interior of said balloon means by which said balloon means may be selectively inflated and deflated.

4,273,506

INDUSTRIAL MANIPULATOR FOR PLACING ARTICLES IN CLOSE PROXIMITY TO ADJACENT ARTICLES

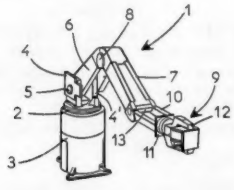
Robert P. Thomson, Nottingham, and James R. Robertson, Runcorn, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Oct. 5, 1978, Ser. No. 948,790

Claims priority, application United Kingdom, Oct. 20, 1977, 43709/77; Dec. 23, 1977, 53748/77

Int. Cl.[3] B66C *1/32*

U.S. Cl. 414—735 **7 Claims**



1. An industrial manipulator for placing articles onto a surface in close proximity to adjacent articles, comprising:

a gripper having a pair of jaws for gripping an article;

support means for positioning the gripper in space;

orientation means for interconnecting the gripper and the support means for orientating the gripper, said orientation means comprising: means for tilting the gripper about a first axis; and means for rotating the gripper about a second axis perpendicular to said first axis, said first and second axis mutually intersecting at a common point located between said jaws, said rotating means being located on the opposite side of said tilting means as the gripper; and

joint means for interconnecting said orientation means to said support means so that said first axis is held parallel to the surface onto which articles are to be placed when the gripper is tilted.

4,273,507

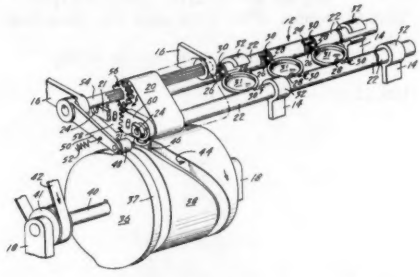
TRANSFER MECHANISM

Frank J. Herdzina, Schaumburg, and Robert P. Vandlik, Mount Prospect, both of Ill., assignors to American Can Company, Greenwich, Conn.

Filed Dec. 4, 1978, Ser. No. 966,198

Int. Cl.[3] B21J *13/08*

U.S. Cl. 414—750 **5 Claims**



1. An apparatus for transferring workpieces including:

(a) support means;

(b) carrier means comprising;

(i) a barrel, slidably and rotatably mounted on said support means and having at least one axial opening in the wall thereof;

(ii) a shaft disposed in said barrel for relative rotation therein;

(iii) a pair of fingers;

a first one of said fingers being mounted on said barrel proximate to said opening and extending radially outwardly therefrom;

the second of said fingers being mounted on said shaft and extending radially outwardly through said opening for gripping cooperation with said first finger;

(iv) said barrel and shaft being relatively pivotable from a first position in which said fingers may lie closely adjacent to one another to a second position in which said fingers are spread, whereby said fingers may cooperatively grip said workpiece in said first position and may release said workpiece in said second position; and

(c) means for lateral reciprocation of said carrier means from said gripping position to said releasing position thereby effecting transfer of said workpiece.

4,273,508

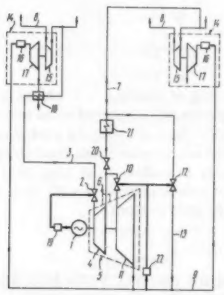
METHOD FOR AUTOMATIC CONTROL OF POWER PLANT AND POWER PLANT OF COMPRESSOR STATION OF GAS PIPELINE SYSTEM, WHEREIN SAID METHOD IS EFFECTED

Mikhail M. Fomichev, ulitsa, Kirova, 20, kv. 1, Krasnodar; Mikhail B. Schepakin, Lefortovsky val, 7/6, Moscow; Anatoly G. Gudz, ulitsa Gertsenoa, 37, kv. 71, Moscow; Viktor G. Evdokimov, ulitsa B. Bronnaya, 5, kv. 26, Moscow; Nikolai E. Lukianov, Teply stan, mikroraion 8a, korpus 7a, kv. 95, Moscow; Irina A. Romanchenko, ulitsa Tramvainaya, 4, kv. 34, and Andrei F. Salnikov, ulitsa Blagoeva, 7, kv. 72, both of Krasnodar, all of U.S.S.R.

Filed Dec. 14, 1978, Ser. No. 969,265

Int. Cl.³ F01D *17/04, 17/08*

U.S. Cl. 415—1 **1 Claim**



1. A method for automatic control of a power plant including an electric generator and an expansion engine having a high-pressure section, a take-off chamber and a low-pressure section and coupled to the electric generator's shaft, which method consists in that

a control signal of the electric load of the electric generator is applied to a first control element which controls the flow rate of gas supplied from the gas line to the high-pressure section of the expansion engine,

a control signal of the pressure downstream of the expansion engine is applied to a second control element which controls the flow rate of a part of the gas flow supplied through the low-pressure section of the expansion engine to a controlled counterpressure gas line;

the control signal of the pressure downstream of the expansion engine is applied to a third control element which controls the flow rate of the rest of the gas flow, which third control element is installed in a line that bypasses the low pressure section of the expansion engine, whereby the rest of the gas flow is directed to the controlled counterpressure gas line.

4,273,509

SELF-POWERED CLEANING UNIT FOR A FLUID PUMP

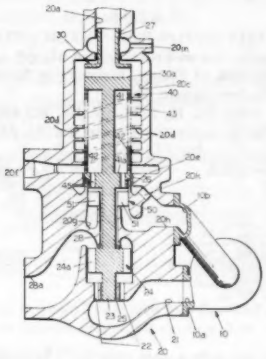
John W. Erickson, Huntington Beach; F. Barton Brown, La Crescenta, and Thomas A. White, Jr., Redondo Beach, all of Calif., assignors to Kobe, Inc., City of Commerce, Calif.

Filed Apr. 23, 1979, Ser. No. 32,035

Int. Cl.³ F01M *1/10;* **B01D** *33/10*

U.S. Cl. 415—111 **13 Claims**

1. A method of lubricating fluid bearings employed in a pumping apparatus required to pump fluid containing a significant quantity of particulates, comprising the steps of: imparting a rotational movement to the fluid containing particulates to separate such fluid into two radially distinct rotating streams, the outer stream containing most of the particulates and the inner stream being relatively free of particulates; directing the inner stream against stationary vane means to convert the rotational energy of the rotating inner stream into a pressure



head; and applying a portion of the pressurized relatively clean fluid stream to lubricate the fluid bearings.

4,273,510

METHOD OF AND DEVICE FOR AVOIDING ROTOR INSTABILITY TO ENHANCE DYNAMIC POWER LIMIT OF TURBINES AND COMPRESSORS

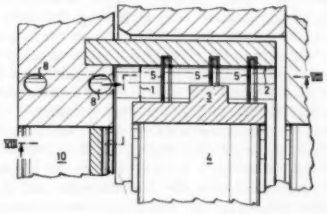
Friedrich Ambrosch, and Rudolf Schwaebel, both of Nuremberg, Fed. Rep. of Germany, assignors to Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Nuremberg, Fed. Rep. of Germany

Continuation of Ser. No. 876,932, Feb. 10, 1978, abandoned, which is a continuation of Ser. No. 723,913, Sep. 16, 1976, abandoned, which is a continuation of Ser. No. 562,235, Mar. 26, 1975, abandoned. This application Apr. 5, 1979, Ser. No. 27,291

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1974, 2413655

Int. Cl.³ F01D *25/04, 11/02*

U.S. Cl. 415—119 **7 Claims**



1. In a method of increasing rotor stability in a fluid actuated axial flow machine having radially spaced rotating and non-rotating elements and contact-free, continuous, circumferential radial seals in a radial gap between said elements, in which said rotating element is subject to excessive oscillations at a critical load so that the power output of said machine is limited to the output below rated load, the fluid flow in said gap having a circumferential component of the gap flow to be defined positive in the sense of rotation of a vibration vector of the natural vibrations, the improvement comprising the step of reducing said fluid flow in the direction of circumferential component to modify oscillations of the rotating elements in said fluid flow, the vibration vector rotating in the same sense as the direction of the rotation of the axial flow machine wherein a second fluid flow is applied to said fluid in said gap having the circumferential gap flow component affected to such an extent that the

lateral force of pressure distribution in the seal is substantially negated.

4,273,511

MAIN ROTOR FOR A HELICOPTER

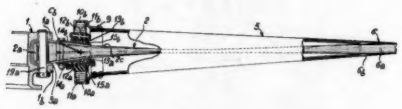
Rene L. Mouille, Aix-en-Provence, and Marcel A. S. Lafargue, Marignane, both of France, assignors to Societe Nationale Industrielle Aerospatiale, France

Filed Jul. 10, 1978, Ser. No. 923,430

Claims priority, application France, Jul. 13, 1977, 77 21657

Int. Cl.³ B64C *27/48*

U.S. Cl. 416—134 A **4 Claims**



1. A rotor, specially a main rotor for a helicopter, comprising a rotor hub and at least two blades

each of said blades includes a spar made of a bundle of glass fibres impregnated with a thermosetting resin,

said bundle being prolonged beyond the blade root towards said rotor hub to constitute a substantially radial flexible and twistable strip, having a substantially rectangular cross section and presenting a decreasing thickness from its outer end near the blade root to its central flattened portion between the blade root and said rotor hub, and an increasing thickness from said central portion to its inner end, where said strip is at the thickest and constitutes a relatively thick terminal part for attachment to the rotor hub,

said strip being surrounded in a spaced-relationship by a tubular rigid sleeve extending along the strip and secured by its outer end to the blade root and by its inner end to a rigid ring to the outside wall of which a blade pitch control lever is connected, said rigid ring surrounding the portion with increasing thickness of the strip which is prolonged beyond said rigid ring in the direction of said rotor hub by said relatively thick terminal attachment part, in which rotor there is inserted between each flat surface of said portion with increasing thickness of the strip and the surrounding rigid ring, from the longitudinal axis of said strip to the rigid ring, a stacking comprising a drag frequency adaptor consisting of a plate of elastomer having great rigidity and high hysteresis, and a laminated part-spherical ball and socket joint member, each said joint member being inserted between the associated plate of elastomer and said rigid ring so that the common center of said joint members is substantially on the longitudinal axis of said radial strip, the said elements and the strip shape determining the flap axis of the corresponding blade cutting the strip longitudinal section on the common center of the ball and socket joint members and the drag axis shifted in the central flattened portion of said strip.

4,273,512

COMPRESSOR ROTOR WHEEL AND METHOD OF MAKING SAME

Wolfgang Weiler, Dachau, Fed. Rep. of Germany, assignor to MTU Motoren-und Turbinen-Union Munchen GmbH, Munich, Fed. Rep. of Germany

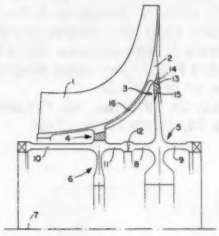
Filed Jul. 11, 1979, Ser. No. 56,526

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1978, 2830358

Int. Cl.³ B23P *15/02;* **F04D** *29/28*

U.S. Cl. 416—188 **9 Claims**

1. Compressor rotor wheel, such as a centrifugal compressor rotor wheel for turbomachines, the blade portions of which are made of a heat-resistant metallic material and the rotor disk portions of which are made of a high-strength metallic material, where a coaxially extending steel connection is provided between the blade portion and the rotor disk portion, characterized in that as the steel connection a spacer ring of steel is provided which is connected on the one side to the blade portion by explosion welding and on the other side to the rotor



disk portion by brazing or welding, and characterized in that the rotor wheel region is manufactured as an integral part and essentially consists of a shell carrying the centrifugal compressor blades, where the steel connections containing the spacer rings are respectively provided at at least two axially and radially spaced-apart points associated with each of which are radially aligned rotor disk sections.

4,273,513

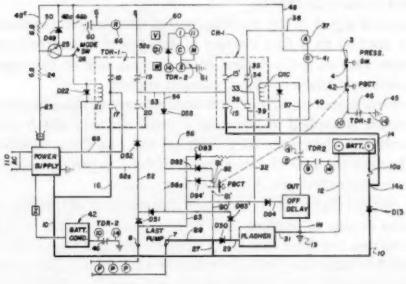
PUMP FAILURE PROTECTION FOR LIQUID TRANSMISSION PIPE LINES

Louis E. Salina, Bridgeville, Pa., assignor to GA Industries, Inc., Pittsburgh, Pa.

Filed Oct. 2, 1978, Ser. No. 948,040

Int. Cl.³ F04B *49/06, 49/10*

U.S. Cl. 417—12 **16 Claims**



1. For use with a pumping station having at least one pump driven from an AC power source which operates through the closing of an auxiliary electric motor circuit and wherein the output of the pump is against the resistance of a flow of liquid through a pipeline to a discharge at a remote location higher than the pump so that, if output pressure at the pumping station fails to sustain the required line pressure there may result a pressure surge of liquid in the pipeline of potentially destructive magnitude and wherein there is a surge valve in close proximity to the pump operable to release liquid from the line to reduce the force of the pressure surge, the apparatus comprising:

(a) a pressure switch responsive to a drop in pressure at the output of the pump, the abnormal stoppage of which may result in a pressure surge;

(b) a solenoid valve operable upon energizing the solenoid to effect the opening of the surge valve;

(c) a relay controlled DC storage battery circuit with a power source energized from the AC power supply to the

pump including the pressure switch which is opened upon such drop in pump pressure and produces conditions to initiate the opening of the solenoid valve and thereby open the surge valve; and

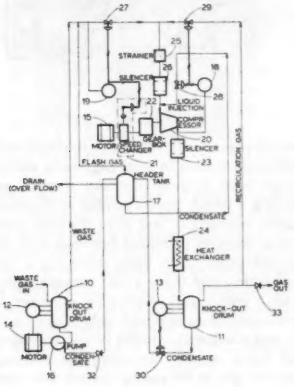
(d) means in said DC circuit to thereupon energize the solenoid valve within a preset time interval following the opening of the pressure switch.

4,273,514

WASTE GAS RECOVERY SYSTEMS

David Shore, Maidenhead, and Robert F. Lintonbon, Weybridge, both of England, assignors to Ferakarn Limited, London, England

Filed Oct. 6, 1978, Ser. No. 949,091
Int. Cl.³ F04B *49/00*
U.S. Cl. 417—15 **13 Claims**



1. In a waste gas recovery system with inlet means for receiving the waste gas and a compressor connected to the inlet means and serving to compress the waste gas; the improvement comprising: means for driving the compressor at a selectable speed, first sensing means for sensing the pressure of the waste gas at the inlet means and for controlling the drive means to drive the compressor at a speed commensurate with the sensed pressure, second sensing means for sensing the temperature at the outlet of the compressor and valve means controlled by said second sensing means and operable to inject liquid acting as a coolant into the waste gas entering the inlet of the compressor in the event that the sensed temperature exceeds a pre-determined value.

4,273,515

LIQUID RING PUMP

James B. Fitch, Marshfield, Mass., assignor to General Signal Corporation, Stamford, Conn.

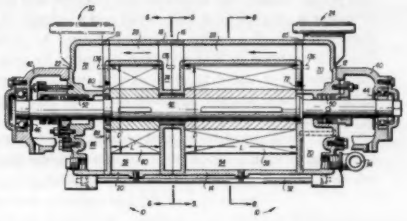
Continuation-in-part of Ser. No. 674,347, Apr. 7, 1976, abandoned. This application Dec. 11, 1978, Ser. No. 968,144
Int. Cl.³ F04B *23/04*; F04C *19/00*
U.S. Cl. 417—62 **5 Claims**

1. An improved liquid ring pump for gases, liquids and mixtures thereof, comprising:

a first stage casing section and a separate second stage casing section,

at least two impellers, a first of which is mounted for rotation within said first stage casing section, and a second of which is mounted for rotation within said second stage casing section, each said impeller having a prime number of radial blades supported thereon at equal angular intervals for pumping said fluids, said first and second impellers having different numbers of blades, whereby the number of excitation frequencies of each said impeller and hence, noise and vibration of said pump, are reduced and the different numbers of blades for the respective impellers cause different excitation frequencies for said impellers to further reduce vibration and noise of the pump,

and at least one suction port and at least one exhaust port located adjacent each said impeller.



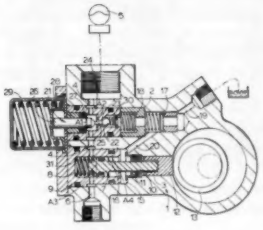
4. The pump of claim **1** in which said first and second stage casing sections include means for causing flow through said casing sections in series.

4,273,516

PUMPS FOR FLUIDS

Glyn P. R. Farr, Leek Wootton, England, assignor to Girling Limited, Birmingham, England

Filed Apr. 2, 1979, Ser. No. 25,864
Claims priority, application United Kingdom, Apr. 11, 1978, 14078/78
Int. Cl.³ F04B *49/08*
U.S. Cl. 417—214 **4 Claims**



1. An hydraulic pump system comprising an hydraulic accumulator for supplying services, a tank for liquid, a pump assembly for pumping liquid from said tank to said hydraulic accumulator to charge said accumulator, and a pressure-responsive valve responsive to pressure in said accumulator for preventing pressure in said accumulator from exceeding a predetermined cut-out valve, wherein said pump assembly comprises a housing having an inlet for connection to said tank for liquid, an outlet for connection to said hydraulic accumulator, an intake check valve in said inlet and a discharge check valve in said outlet, and a bore, means defining a working chamber, a pump piston reciprocably mounted in said bore to draw liquid from said inlet and into said working chamber during an induction stroke defined by movement of said pump piston in a first direction, and to force liquid from said working chamber to said outlet during a power stroke defined by movement of said pump piston in a second opposite direction, drive means for urging the pump piston in said first direction, and means for subjecting said pump piston to the effect of pressure at said outlet to move said pump piston in said second direction, said pump piston being of stepped outline having a first area over which pressure at said outlet acts, and a second area smaller than said first area for acting on said liquid in said working chamber

during said induction and power strokes, and said pressure-responsive valve is disposed between said discharge check

valve and said outlet, said pressure-responsive valve being movable between an open position, and a closed position when pressure in said accumulator attains said cut-out value, in said open position liquid can be forced from said working chamber to said hydraulic accumulator during said power stroke, and in said closed position said working chamber is isolated from said outlet and a volume of liquid drawn into said working chamber during an induction stroke is trapped in said working chamber by said pressure-responsive valve to prevent said pump piston from moving in said second opposite direction whereby said pump is disabled and no further circulation of liquid can take place until pressure in said accumulator has reduced to a predetermined cut-in pressure which is less than said cut-out value of pressure in said accumulator.

4,273,517

CONTROL DEVICE FOR AN AXIAL PISTON MACHINE

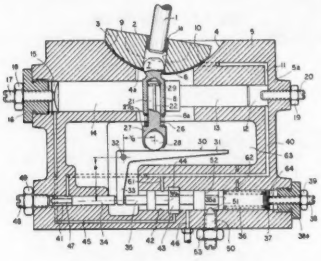
Walter Heyl, Johannesberg, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Aug. 1, 1978, Ser. No. 930,031

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1977, 2734933

Int. Cl.³ F04B *1/26*; F01B *13/04*

U.S. Cl. 417—222 **18 Claims**



1. In a control device for the adjustment of the displacement per revolution of an axial piston pump having a housing, a displacement-controlling member angularly displaceable in said housing and acting upon a cylinder drum of the pump, a setting piston constituted as a differential piston and having large-diameter and small-diameter portions connected to said member for displacing same, a small surface of the differential piston being subjected to pump pressure and a large surface of the differential piston being subjected to pump pressure as controlled by a valve member forming a control element, a bell crank lever fulcrumed in said housing and engaged by a pressure body connected to said setting piston for effecting force transmission between said valve member and said setting piston, the improvement which comprises in combination:

(a) a first spring interposed between said setting piston and said pressure body, said spring urging said pressure body toward said bell crank lever;

(b) a control piston bearing upon one side of a first end of said bell crank lever and urged by the aforementioned pump pressure thereagainst; and

(c) a second spring bearing upon said valve member and urging same against the opposite side of said first end of said bell crank lever, the pressure on said control piston and the force of said first spring acting in opposite directions on said bell crank lever and said second spring bearing directly upon said valve member.

4,273,518

SWASH-PLATE TYPE COMPRESSOR

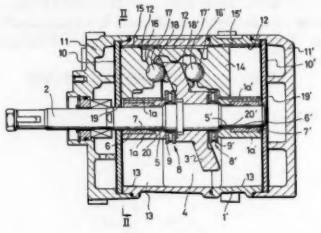
Tsunenori Shibuya, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Saitama, Japan

Filed Aug. 22, 1979, Ser. No. 68,509

Claims priority, application Japan, Oct. 16, 1978, 53-141990[U]

Int. Cl.³ F04B *1/12*

U.S. Cl. 417—269 **5 Claims**



1. In a swash-plate type compressor having a pair of cylinder blocks combined together in axial alignment, each including an axial through bore formed centrally thereof, said cylinder blocks defining a swash plate chamber therebetween; a drive shaft rotatably inserted in said axial through bores; a pair of radial bearing sections provided between said axial through bores and said drive shaft, each receiving a radial bearing radially supporting said drive shaft; a swash plate secured on said drive shaft within said swash plate chamber; and a pair of valve plates arranged on opposite ends of said combined cylinder blocks; said combined cylinder blocks including a plurality of cylinder bores axially extending therethrough, each of which receives a piston for sliding therein and cooperates with the valve plates and the piston to form pumping chambers therebetween; and said swash plate has an outer fringe thereof disposed in engagement with the pistons and is rotatable in unison with the drive shaft being rotated to cause reciprocal motion of the pistons within the resective cylinder bores to carry out pumping action;

the improvement comprising:

a gap provided between said drive shaft and each of said through bores; and

passage means directly communicating each of said pumping chambers formed in at least one of the cylinder bores with said gap provided between said drive shaft and each of said through bores;

said gap communicating said passage means with said swash plate chamber through an associated one of said radial bearings, whereby part of oil contained in refrigerant gas in said associated pumping chamber is supplied to said associated radial bearing section via said passage means and said gap due to a pressure difference between said swash plate chamber and said associated pumping chamber caused by the reciprocating movement of said piston within said at least one of the cylinder bores.

4,273,519

SPLIT CRANKCASE RADIAL AUTOMOTIVE COMPRESSOR

Edwin L. Gannaway, Adrian, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Sep. 5, 1978, Ser. No. 939,877

Int. Cl.³ F16J *10/02*; F04B *1/04*

U.S. Cl. 417—273 **13 Claims**

1. A radial compressor comprising:

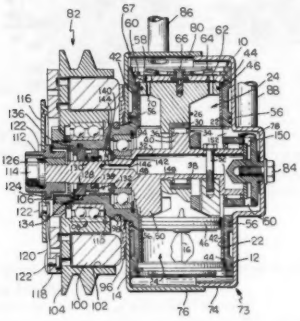
a crankcase having at least three radially oriented cylinders therein, said crankcase comprising two halves in abutment along a planar interface axially intersecting said cylinders such that each of said cylinders is defined by a pair of

semicylindrical recesses in the respective halves of said crankcase,

a crankshaft received in said crankcase and positioned at the common center of said cylinders,

a plurality of cylindrical pistons connected to said crankshaft so as to form therewith an interconnected assembly, said pistons being received in said cylinders, respectively,

a cylindrical cylinder liner received in each of said cylinders



and having said pistons received therein, said liners each having a cylindrical outer surface which is completely enclosed within said crankcase and which is contacted around substantially its entire periphery by the confronting surfaces of the respective pair of semicylindrical recesses, said liners serving to align the semicylindrical recesses of the respective pairs in a tangential direction relative to the axis of said crankshaft, and

means for sealing one end of each of said liners.

4,273,520

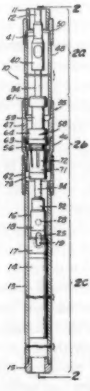
DEEP WELL PUMP

Wayne N. Sutliff, and Jim L. Downen, both of 2931 Pierce Rd., Bakersfield, Calif. 93308

Filed Nov. 20, 1979, Ser. No. 96,066

Int. Cl.³ F04B *47/02, 21/04*

U.S. Cl. 417—434 **2 Claims**



1. In a deep well pump adapted to be mounted on the lower end of a pump tubing string and operated through a connection made with the lower end of a sucker rod string extending downwardly through said pump tubing string, the combination of:

a pump barrel open at its lower end for the free entry thereinto or exhaust therefrom of well fluid;

a tubular adapter assembly screw connecting at its lower end to the top of said barrel and provided at its upper end with screw means for being connected to the lower end of a pump tubing string;

an internally upwardly bevelled annulus means mounted within said adapter assembly

a tubular pump head normally extending downwardly at least partly through said annulus means and resting downward on and making a sealing downward engagement with said annulus means;

latch means carried by said head for inwardly yieldingly engaging said annulus means from beneath to effectively latch said head against withdrawal upwardly from said connection with said annulus means but permitting said head to be so withdrawn by a continued upward strain on said head; said head having an axial bore;

a hollow plunger slidable in said barrel;

a hollow polish rod connecting coaxially at its bottom end to the top of said plunger and extending coaxially upwardly slidably through the bore of said head to close off a pumped oil compression chamber confined by the top of the pump plunger, the pump barrel between the pump plunger and the sealing annulus means, the pump head and the portion of the hollow polish rod located at the moment between said head and said plunger;

means at the upper end of the hollow polish rod adapting the same to be screw connected to the lower end of a sucker rod string while providing for the discharge into the pump tubing string of the oil delivered upwardly to the lower end of the sucker rod string; and

a tandem pair of check valves mounted in superposed relation within an upper end portion of said plunger, the lower valve opening to receive oil from beneath through the plunger on its down stroke, the upper valve closing on the down stroke to divert said oil laterally to the oil compression chamber, the upstroke of the plunger reversing the valve positions to positively force the oil from the compression chamber into the space between the two valves thus hydraulically closing the bottom valve and opening the upper valve from which the oil has nowhere to go except up the polish rod and pump tubing string;

the tubular adapter assembly being of sufficient length and adequate in internal diameter to provide a pump head and plunger bypassing drain chamber when said head and plunger are withdrawn upwardly from said barrel and through said annulus means.

4,273,521

DRIVE ARRANGEMENT

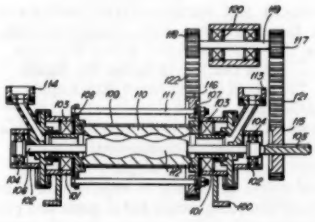
Donald E. Baker, and David W. Bouette, both of Macclesfield, England, assignors to E. T. Oakes Limited, Cheshire, England

Filed Feb. 9, 1979, Ser. No. 10,917

Claims priority, application United Kingdom, Feb. 10, 1978, 5542/78

Int. Cl.³ F04C *2/16*

U.S. Cl. 418—48 **5 Claims**



1. A helical gear pump, compressor or motor including an inner member with an external helical gear form having n starts; an outer member with a cooperating internal helical

gear form having $n \pm 1$ starts; at least one shaft rotatable about a first axis and connected to said inner member for rotation therewith; a support for supporting the outer member for rotation about a second axis laterally spaced from the first axis; and a geared connection between said inner and outer members, whereby the inner and outer members can rotate synchronously without any driving contact between the helical gear forms of the inner and outer members.

4,273,522

REINFORCING MEMBER SUPPORT IN CONCRETE EXTRUDERS

Norman W. Bunn, West Vancouver, and Christopher B. Bunn, North Vancouver, both of Canada, assignors to Dyform Engineering Limited, Vancouver, Canada

Filed Sep. 17, 1979, Ser. No. 76,294
Int. Cl.³ B28B *23/18;* B29C *3/00*
U.S. Cl. 425—113 **13 Claims**

1. An extrusion machine for making elongated articles of concrete-like moldable material having at least one reinforcing member therein and extending longitudinally thereof, comprising;

a conveyor chamber,

an open-ended mold of a desired cross-sectional shape aligned with one end of the chamber and in communication therewith,

conveyor means in the chamber and extend to the mold,

a support tube extending longitudinally of the chamber to the mold to receive and support an elongated reinforcing member extending therethrough and through the mold when an elongated article is to be made,

said tube having a slot therein opening upwardly therefrom, and

means for directing concrete-like material into the chamber and through said slot into the support tube around the reinforcing member therein, said conveyor means being operable to move the concrete-like material under pressure through the mold around said reinforcing member.

4,273,523

SWEEP ELL PRODUCTION APPARATUS

Joseph A. Levens, Houston, Tex., assignor to Nipak, Inc., Dallas, Tex.

Filed Oct. 29, 1979, Ser. No. 88,418
Int. Cl.³ B29C *17/07;* B29D *23/04*
U.S. Cl. 425—326.1 **7 Claims**

1. Apparatus for producing a pipe ell having a predetermined radius of curvature, comprising:

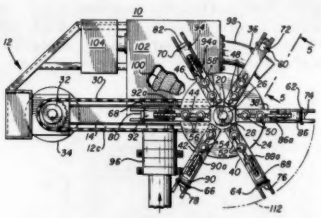
means for producing extruded pipe;

a curved sleeve positioned to receive said extruded pipe from said extruding means and to guide said pipe along an arc having said predetermined radius of curvature;

said sleeve being perforated along at least a portion thereof;

means connected to the perforated portion of said sleeve for applying vacuum pressure to size said pipe; and

means movable along a continuation of the arc having said predetermined radius of curvature for circumferentially engaging and for pulling said extruded pipe from said



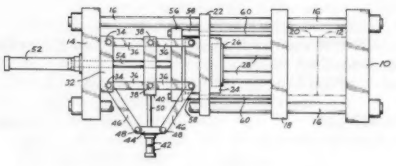
sleeve to draw said extruded pipe along the arc continuation to form the pipe ell.

4,273,524

PLATEN TYPE MOLDING PRESS

John A. Smith, Cinnaminson, N.J., assignor to Hull Corporation, Hatboro, Pa.

Filed Oct. 18, 1978, Ser. No. 952,496
Int. Cl.³ B29F *1/00*
U.S. Cl. 425—450.1 **5 Claims**

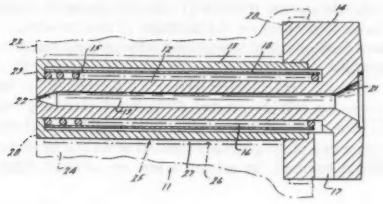


1. In a platen type molding press having fixed and movable platens mounting mold components, the movable platen being mounted on guide rods extending between the fixed platen and a stationary base, a series-connected assembly of extensible platen drive and locking mechanism and extensible mold clamping mechanism interengaging the stationary base and the movable platen, the drive mechanism being operable to move the movable platen between a retracted, mold-open position for removing molded components therefrom and an extended position in which the mold component mounted on said movable platen is in a mold-closed position closed against the mold component mounted on the fixed platen and locked releasably against retraction from said mold-closed position, and the extensible mold clamping mechanism being operable to apply high clamping pressure to the mold component on the movable platen, the combination therewith of a second extensible platen drive mechanism connected between the stationary base and movable platen in parallel with said series-connected drive and locking mechanism and mold clamping mechanism for moving the movable platen between said extended, mold-closed position and a second retracted, mold-open position in which the mold component mounted on said movable platen is spaced from the mold component on the fixed platen a distance greater than the first mentioned retracted, mold-open position afforded by the firts named platen drive and locking mechanism.

4,273,525
INJECTION MOLD BUSHING

David M. Reitan, Keene, N.H., assignor to Incoe Corporation, Troy, Mich.

Continuation of Ser. No. 870,849, Jan. 19, 1978, abandoned. This application Mar. 16, 1979, Ser. No. 21,155
Int. Cl.[3] B29F 1/08
U.S. Cl. 425—549 15 Claims



1. A hot sprue bushing adapted to be mounted in a mold part, said bushing having

a head portion at the rearward end thereof,

a material passage extending in substantially a straight path entirely therethrough from the rearward end to the forward end thereof, and

an annular heat insulating space surrounding and spaced radially outwardly from said passage; and

heater means in said annular space in heat exchange relation with the inner annular wall thereof,

said material passage having an inlet opening through the rearward end of said head portion and an outlet having a tapered section terminating in a material discharge orifice opening through the forward end of said bushing,

the rearward terminal portions of said annular space and of said heater means extending into said head portion but terminating short of the rearward end of the latter,

said head providing a relatively large metallic mass having substantial strength to withstand forces imposed thereon in use by material in said passage and said head further adapted to be heated in use by the portion of said heater means disposed therein and defining a heat sink for heating the portion of said passage and material therein extending axially rearwardly beyond said heater means,

the forward terminal portions of said annular space and of said heater means at least partially overlapping said tapered section,

and

the portion of said bushing disposed forwardly of said heater and of said annular space providing a direct radial heat flow path between the mold and said orifice whereby to permit coolant conventionally circulated through the mold to freeze material in said orifice during removal of a part from said mold while permitting said heater to maintain material in said outlet behind said orifice and in said passage in a fluid condition.

4,273,526
AUTOMATIC DAMPER CONTROL

Nicholas J. Perrelli, 131 Woodward Dr., West Seneca, N.Y. 14224

Filed Jul. 12, 1979, Ser. No. 56,836
Int. Cl.[3] F23N 3/00
U.S. Cl. 431—20 7 Claims

1. An automatic damper control comprising:

(a) a damper for use in a flue or the like;

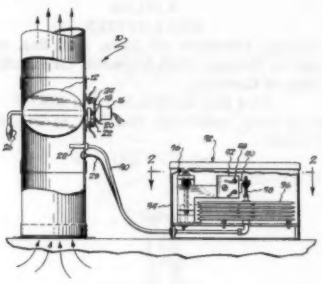
(b) diaphragm means adapted to expand and contract in response to pressure variations in said flue;

(c) sensor means for sensing the pressure in said flue, said sensor means being connected to said diaphragm means, said sensor means comprising means for generating a plurality of beams of light, photoreceptors, and collimating means adapted to collimate each of said beams of light onto a photoreceptor;

(d) blocking means for blocking at least one of said beams of light, said blocking means being operatively associated with said diagphragm means and being adapted to be displaced relative to said beams of light in response to movement by said diaphragm means;

(e) drive means for moving said damper means in response to pressure variations in the flue;

(f) wherein said collimating means comprises a collimating plate arranged between said light generating means and said photoreceptors, said collimating plate comprising an orifice aligned with each of said light generating means and said photoreceptors so as to collimate each of said beams of light onto each of said photoreceptors;



(g) wherein said blocking means comprises blocking plate means arranged between said means for generating said beams of light and said photoreceptors adjacent said collimating plate;

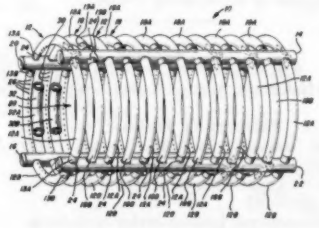
(h) said blocking plate means being arranged relative to said orifices such that a single one of said orifices may be exposed in response to movement of said blocking plate means; and

(i) wherein said diaphragm means comprises a bellows, said blocking plate means being mounted on said bellows such that said blocking plate means move relative to each of said orifices as said bellows expands and contracts in response to pressure variations in the flue.

4,273,527
MULTIPLE FUEL BURNING SYSTEM FOR FURNACES OR THE LIKE

Cyril F. Meenan, 7349 Ridgeway, Skokie, Ill. 60076

Filed Sep. 4, 1979, Ser. No. 72,103
Int. Cl.[3] F27D 17/00
U.S. Cl. 431—177 13 Claims



1. A fuel burning system for a furnace or the like capable of burning multiple fuels comprising:

a plurality of first annular tubular conduits coupled to a first supply of pressurized gas,

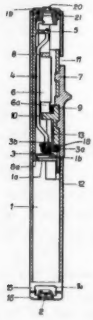
a plurality of second annular tubular conduits alternately spaced between said first conduits coupled to a second supply of pressurized gas,
a plurality of third annular tubular conduits coupled to a source of liquid to be heated,
said first, second and third annular tubular conduits defining a combustion chamber,
said first and second tubular conduits are concentric and said third tubular conduit is concentric with and positioned between said first and second tubular conduits,
a first nozzle in said combustion chamber coupled to a source of a first combustible fuel,
a second nozzle in said combustion chamber coupled to a source of a second combustible fuel, and
a third nozzle in said combustion chamber coupled to a source of a third combustible fuel.

4,273,528

GAS LIGHTER

Reiner Göbelt, Offenbach am Main, Fed. Rep. of Germany, assignor to Rowenta-Werke, GmbH, Offenbach am Main, Fed. Rep. of Germany

Filed Dec. 5, 1978, Ser. No. 966,937
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1977, 2754639
Int. Cl.³ F23Q *7/12*
U.S. Cl. 431—255 **10 Claims**



1. In a gas lighter of a type comprising a cylindrical tank provided with a burner valve, a conduit connecting the burner valve to a combustion space, a subassembly comprising a substantially semi-cylindrical holder and a semi-cylindrical axially displaceable actuating member, and an electrical ignition device mounted in said holder and covered by said member, the actuating member being provided with means for operating the ignition device and means for opening the burner valve, an improvement wherein a one-piece tubular sleeve surrounds and holds together the tank, the holder, and the actuating member, the sleeve having an aperture therein to permit manual movement of the actuating member.

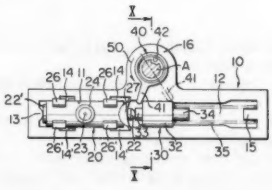
4,273,529

PIEZOELECTRIC IGNITION DEVICE

Kazumi Nakahara, Nagoya, Japan, assignor to NGK Spark Plug

Filed May 24, 1979, Ser. No. 42,135
Claims priority, application Japan, May 30, 1978, 53/72980[U]
Int. Cl.³ F23Q *3/00*
U.S. Cl. 431—255 **7 Claims**

1. A piezoelectric ignition device comprising:
a base mount having an elongated window with first and second contiguous window portions,
a cylindrical piezoelectric element fixedly held in said first window portion,
a cylindrical hammer slideably held in said second window portion for axial movement between a normal position wherein one end of said hammer rests on an end of said piezoelectric element and a retracted position,
spring means for urging said hammer toward said normal position and for rapidly returning said hammer into said normal position after been brought into said retracted position, whereby an ignition spark is generated,
said ignition device being operable with a gas equipment having a gas valve actuated by an axle connected thereto, wherein manual rotation of said axle opens or closes said valve depending on the direction of said rotation,
a hole formed in said base mount for snugly rotatably receiving said axle,
an actuation arm member having a hole therein for loosely receiving said axle, means for producing unitary rotation of said actuation arm member with said axle, said rotation being in a plane generally parallel to an axis of said cylindrical hammer, an actuation arm on said actuation arm



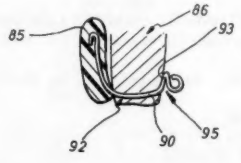
member having a free end normally abutting a forward end of said cylindrical hammer when said cylindrical hammer is in said normal position when said axle is in a position which closes said gas valve, said arm free end being operative to move said hammer into said retracted position against the force of said spring means when said axle is rotated in a direction which opens said gas valve and being further operative to disengage said hammer for permitting said hammer to rapidly return to said normal rest position, and
another spring means operative to urge said actuation arm member into a normal stance while said arm member is rotated toward said retracted position and further operative to permit said actuation arm member to tilt on said axle whereby said arm free end may slide along the circumferential surface of said cylindrical hammer against the force of said another spring means to allow said actuation arm member to return to said normal position.

4,273,530

ORTHODONTIC APPLIANCE AND CLASP THEREFOR

Garfford J. Broussard, 203 Chimney Rock, Houston, Tex. 77024

Filed May 17, 1979, Ser. No. 39,798
Int. Cl.³ A61C *7/00*
U.S. Cl. 433—6 **6 Claims**



1. An orthodontic appliance for teeth, comprising:
an inner mouth portion;
at least one clasp, said clasp bent from a length of orthodontic wire, and said clasp including:

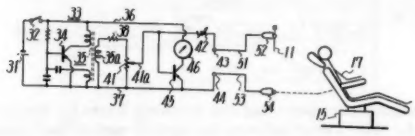
a shank portion positioned in at least one interproximal site in the lingual surface of the inner mouth portion;
an intermediate portion for occupying an occlusal or incisal interproximal space in the teeth;
a downwardly depending hook portion attached to said intermediate portion, and bent so as to occupy a labial or buccal interproximal space of the teeth; and
an eye portion attached to said hook portion, adapted for receiving an archwire.

4,273,531

ROOT CANAL MEASURING APPARATUS

Kiyoshi Hasegawa, 2-11-10. Hirata, Ichikawa-shi, Chiba-ken, Japan

Filed May 9, 1979, Ser. No. 37,293
Claims priority, application Japan, May 15, 1978, 53/57304
Int. Cl.[3] A61C *19/04*
U.S. Cl. 433—27 **9 Claims**



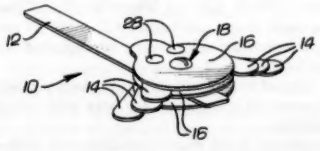
1. A root canal measuring apparatus comprising:
a DC power source having positive and negative terminals;
an oscillating circuit having a relatively high output impedance and connected at one output end to the negative terminal of said power source and at its other output end to the positive terminal thereof, said oscillating circuit producing a high frequency output;
a first output terminal leading from one output end of said oscillating circuit;
a second output terminal leading from the other output end of said oscillating circuit;
a first electrode connected to said first output terminal of said oscillating circuit, said first electrode comprising a probe insertable through a root canal of a patient to his periodontal membrane whose root canal length is to be measured;
a support for said patient including a conductive portion which forms with the patient an electrostatic capacitor; and
coupling means connecting said second output terminal and said support;
means for detecting variations in voltage between said first and second output terminals; and
display means responsive to the detection of voltage.

4,273,532

EDENTULOUS IMPRESSION CORRELATOR AND METHOD OF USING SAME

Martin A. Hass, 1105 El Medio Dr., Pacific Palisades, Calif. 90272

Filed Sep. 14, 1979, Ser. No. 75,753
Int. Cl.[3] A61C *9/00*
U.S. Cl. 433—37 **7 Claims**



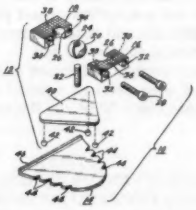
1. An edentulous impression correlator comprising:
an arm that serves as a handle and is adapted to project from a patient's mouth; and
at least three pairs of wings forming a support for impressionable material, said wings having horizontal surfaces extending outwardly and forwardly from said arm when in a patient's mouth, said wings being arranged in pairs that are stacked horizontally, the wings of each pair having a generally V-shaped configuration, and the wings of the lower-most of said pairs being closest to said arm and forming the largest angle therebetween.

4,273,533

METHOD FOR CONSTRUCTING DENTURES

John B. Della Croce, 450 Washington St., Freeland, Pa. 18224

Filed Aug. 10, 1979, Ser. No. 65,484
Int. Cl.[3] A61C *11/00*
U.S. Cl. 433—55 **12 Claims**



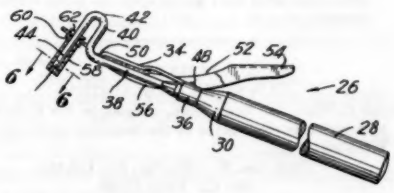
1. In the construction of dentures, a method for calibrating an articulator, said method comprising the steps of:
(a) rigidly and intra-orally mounting a tracing table member to one of a patient's upper and lower jaws;
(b) rigidly and intra-orally mounting a scribing member to the other of said patient's jaws;
(c) adjusting and locking the angular relationship and distance between bearing surfaces of said tracing table and said scribing member to bring said bearing surfaces into contact when said jaws are held slightly apart;
(d) forming a first set of three gothic arch traces, the traces defining a three-dimensional envelope of motion; and,
(e) utilizing the first set of traces to form a substantially identical second set of gothic arch traces on the articulator, whereby relative movement of the articulator may be confined to the envelope of motion after the first set of gothic arch traces has been removed.

4,273,534

AMALGAM CARRIER AND DISPENSER

Paul A. Seid, New City, N.Y., assignor to Sultan Dental Products, Inc., Englewood, N.J.

Filed Aug. 27, 1979, Ser. No. 69,613
Int. Cl.[3] A61C *5/04*
U.S. Cl. 433—90 **13 Claims**



1. An amalgam carrier and dispenser comprising:
a handle;
a plunger element affixed to said handle, said plunger ele-

ment having a substantially rectilinearly extending portion having a forward end region and a terminal end region, the latter having an axial length which terminates at a free end surface;

an open ended sleeve element having a substantially rectilinearly extending internal bore terminating at a free end, said plunger portion of said plunger element being located within said bore such that said plunger element is axially slideable within said sleeve element bore;

lever means associated with said sleeve element for axially moving said plunger portion within said sleeve element bore between a first position wherein said free end surface of said plunger portion is located interiorly of said sleeve element bore recessed inwardly from said free end of said sleeve element a predetermined distance so as to define a cavity within said sleeve element for carrying amalgam and a second position wherein at least a portion of the axial length of said terminal end region of said plunger portion extends exteriorly of said sleeve element bore so that said free end surface of said plunger portion extends beyond said free end of said element to dispense the amalgam carried in the cavity; and

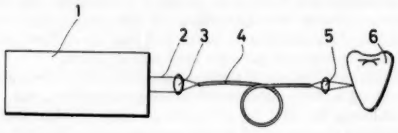
wherein said terminal end region of said plunger portion is formed of wear resistant material which has a hardness greater than about 20 on the Rockwell C scale.

4,273,535

DEVICE FOR PREVENTING TOOTH DECAY BY LASER BEAM IRRADIATION AND METHOD OF PREVENTING TOOTH DECAY BY USE OF THE SAME

Hajime Yamamoto, Izumi, and Shogo Yoshikawa, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Filed Sep. 14, 1979, Ser. No. 75,645
Claims priority, application Japan, Dec. 4, 1978, 53/150402
Int. Cl.³ A61C *3/00, 19/06*
U.S. Cl. 433—216 **4 Claims**



1. A device for preventing tooth decay by irradiation of laser beams, said device comprising:

a continuous excitation Nd:YAG laser oscillator having a mean output capacity of at least 10 watts and a peak output limited to less than 100 KW;

an ultrasonic Q-switch for Q-switching said continuous excitation Nd:YAG laser at a rate from 1 to several kHz;

a condensing lens means for transmitting Q-switch pulses projected from said oscillator;

a transmitting means consisting of glass fibers for transmitting the thus condensed laser beams; and

a condensing lens means for convergently irradiating the thus transmitted laser beams upon the tooth surface to be treated.

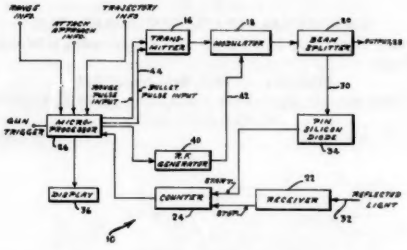
4,273,536

GUN SIMULATOR SYSTEM

Ralph E. Wick, Las Vegas, Nev., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 28, 1980, Ser. No. 115,844
Int. Cl.³ F41F *27/00*
U.S. Cl. 434—14 **7 Claims**

1. A gun simulator system comprising a source of electromagnetic radiation energy at a first location for transmitting a plurality of electromagnetic pulses, a target at a second location, means optically aligned with said plurality of pulses for continually varying the angle of output of said pulses, means optically aligned with said plurality of pulses for directing a substantial portion of all of said electromagnetic radiation of each of said pulses in the direction of said target and the remainder of said electromagnetic radiation of each of said pulses in another direction indicative of the start of each of said pulses, means on said target for reflecting said pulses, means optically aligned with said target for receiving said reflected pulses, computer means operably connected between said



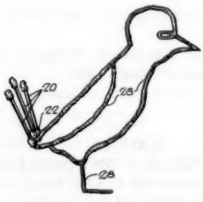
electromagnetic source and said receiving means for comparing the time interval between the start of each of said pulses and the reception of the same pulse in order to determine whether said pulse is received within a preselected time interval thereby establishing range information and for comparing said range information with preselected trajectory information corresponding to said range information, whereby the output of said computer means provides a signal indicative of whether the output of said gun fired at said target would strike said target.

4,273,537

SELF-ADHERING EDUCATIONAL DEVICES FOR CONSTRUCTING LETTERS, FIGURES, DESIGNS AND THE LIKE

Bernard Borisof, 3920 N. Lake Shore Dr., Chicago, Ill. 60613

Continuation of Ser. No. 605,239, Aug. 18, 1975, abandoned. This application Mar. 4, 1977, Ser. No. 774,706
Int. Cl.³ A63H *33/14*
U.S. Cl. 434—83 **16 Claims**



1. A tangible line adapted to be shaped into free-standing models,

said tangible line comprising a length of flexible cord,

said cord being impregnated with a flexible pressure-sensitive adhesive wax material which is viscous enough to retain a thick shape and sufficiently rigid to make said cord self-supporting after being impregnated with said wax material,

said wax material being malleable and having pressure-sensitive adhesive characteristics to make said tangible line self-adhering,

said wax material being microcrystalline wax with mineral oil in the proportion of 2 to 12% mixed with said microcrystalline wax to provide greater tackiness,

said microcrystalline wax being of a flexible type with a

melting point between 150° and 180° F. and a needle penetration between 20 and 50 when measured at 77° F. in accordance with ASTM Standard No. D1321.

4,273,538

EDUCATIONAL AID

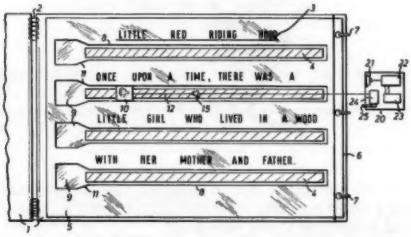
Arnold S. Ross, London, England, assignor to Douglas Alan Ross, Geneva, Switzerland, a part interest

Filed Aug. 30, 1979, Ser. No. 71,158

Claims priority, application United Kingdom, Sep. 6, 1978, 35815/78

Int. Cl.³ G09B *17/00*; G11B *5/80*

U.S. Cl. 434—178 **2 Claims**



1. Apparatus for teaching reading comprising a book having a plurality of first sheets bearing spaced lines of printed text, a plurality of magnetic strips associated respectively with said lines of printed text and each bearing a sound recording of the associated text so positioned that the second record of each word is adjacent that word in the printed text, a second transparent sheet in said book adapted to overlay each of said first sheets in succession, guide slots in said transparent sheet for exposing the magnetic strips on a selected one of said first sheets, means for reproducing said sound records comprising a pick-up device having a flat base and adapted to rest under its own weight on said magnetic strip in a guide slot without obscuring the associated printed text, and means attached to said device for drawing said pick-up device along said guide slot to reproduce the sound recording on the magnetic strip adjacent said guide slot simultaneous with the user's reading of the printed text associated with said magnetic strip.

4,273,539

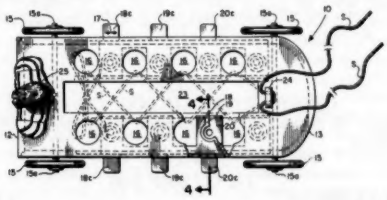
SHOE-TYING TRAINING TOY

Glenn T. Moore, 1742 Terpsichore St., New Orleans, La. 70113

Filed Nov. 23, 1979, Ser. No. 96,688

Int. Cl.³ G09B *19/00*

U.S. Cl. 434—260 **9 Claims**



1. A child's training toy for training a child how to lace shoes and the like, comprising:

a body having a extended exposed area on its top side;

a series of pairs of opposed, open eyelets disposed on said body down along said open area, said eyelets being formed of movable members whose movements change the crosssectional areas of the openings of said eyelets to vary the skill level necessary for the child to thread a string through said eyelets; and

opening adjustment means carried by said body and connected to said movable members for increasing and decreasing the effective opening areas of said eyelets, the opening area of each of said eyelets being openable to a maximum opening for beginning the training and then closeable ultimately to a significantly smaller size equivalent to the opening area of the standard eyelet on a real child's shoe.

4,273,540

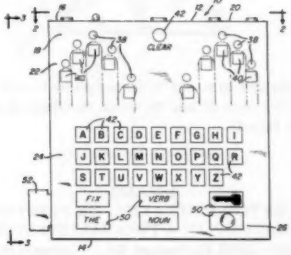
THERAPIST'S PATIENT EVALUATION AND TRAINING DEVICE

Randy B. Dill, 49 Walnut St., Ambler, Pa. 19002

Filed Apr. 17, 1980, Ser. No. 141,216

Int. Cl.³ G09B *23/28*

U.S. Cl. 434—262 **10 Claims**



1. A therapist's patient evaluation and training device for use in evaluating disorders of brain damaged patients and of patients who have suffered damage to the central nervous system, comprising: a casing having an upper surface; a digit section carried by said casing and including a plurality of spaced electrically energizable digit means arranged in an array approximating the five digits of at least one hand; a keyboard section carried by said casing and including a plurality of spaced electrically energizable keyboard means having indicia thereon; each of said digit and keyboard means including portions thereof operable to produce respective discreet illuminations adjacent said upper surface upon appropriate actuation thereof by a patient; control means selectively operable by a therapist to render said digit and keyboard sections operable in a plurality of modes; during one of said modes said digit means are cycled through a first digit means operational sequence and during other of said modes said digit means are cycled through a second digit means operational sequence; and during another of said modes said keyboard means are cycled through a first keyboard means operational sequence and during still another of said modes said keyboard means are cycled through a second keyboard means operational sequence.

4,273,541

CLOCK FOR EDUCATIONAL PURPOSES

Shozo Ishiyama, Tokyo, Japan, assignor to Gakken Co., Ltd., Tokyo, Japan

Filed Apr. 2, 1980, Ser. No. 136,523

Claims priority, application Japan, Apr. 6, 1979, 54-45386[U]

Int. Cl.³ G09B *19/12*

U.S. Cl. 434—304 **19 Claims**

1. A clock for educational purposes, comprising:

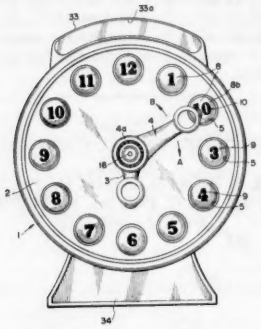
a minute hand and an hour hand, both rotatably mounted at the center of the clockface;

twelve openings formed in the clockface at locations where the hours and minutes are indicated;

a rotating member provided for each said opening and each marked on its surface with an hour indicating figure and a

minute indicating figure, the surface of each rotating member being partially exposed through respective ones of said openings;

movable members each secured to a shaft of said rotating member; and



an arm adapted to rotate with said minute hand to oscillate respective ones of said movable members as said minute hand is turned.

4,273,542

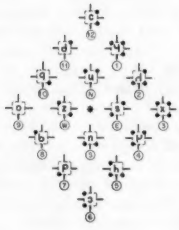
DEVICES FOR DISPLAYING OR PERFORMING OPERATIONS IN A TWO-VALUED SYSTEM

Shea Zellweger, 1483 Robinwood Rd., Alliance, Ohio 44601

Continuation of Ser. No. 729,119, Oct. 4, 1976, abandoned. This application May 31, 1979, Ser. No. 44,170

Int. Cl.³ G09B *1/32*

U.S. Cl. 434—433 **8 Claims**



1. An apparatus for displaying and performing a complete set of the sixteen binary connectives in a two-valued notational system, said apparatus comprising:

a set of six devices, each device including a first area and a second area opposed to the first area, each first area including a symbol, and each second area including a same-shape repeat in see-through orientation of the symbol on the corresponding first area;

each of said symbols having a shape selected to indicate a selected number of from zero to four components arranged with respect to the quadrants of a set of Cartesian corrdinates, wherein the shapes of said symbols have iconicity, eusymmetry, and frame consistency with respect to said quadrants of Cartesian coordinates and the alignments of said shapes of said symbols are symmetry positional with respect to the axes of said Cartesian coordinates;

said six symbols on said first areas chosen such that said six devices can be positioned by a combination of rotation and flip operations to display and perform all sixteen binary connectives.

4,273,543

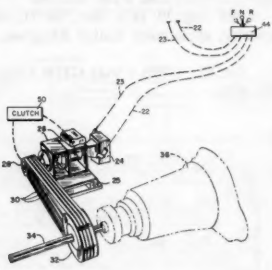
EMERGENCY MARINE PROPULSION USING EXISTING PROPELLER SHAFT

James D. McCusker, Bergenfield, N.J., assignor to Engine Technology, Inc., Rahway, N.J.

Filed Oct. 1, 1979, Ser. No. 80,184

Int. Cl.³ B63H *23/10*

U.S. Cl. 440—4 **10 Claims**



1. An emergency marine propulsion means for vessels having a single propeller shaft normally driven by a main engine, said propulsion means including:

(a) an electrical generator adapted to generate electrical current of a given voltage and amperage when rotated at a selected speed to deliver this current for use on said vessel;

(b) a diesel engine adapted to drive said electrical generator by and through a connected means;

(c) means for maintaining a relatively constant regulated and desired speed of the diesel engine and generator;

(d) means for driving a connected hydrostatic pump by the diesel engine;

(e) a hydraulic reservoir and filter adapted to feed filtered hydraulic fluid from the reservoir to the driven hydrostatic pump;

(f) a hydrostatic motor adapted for rotative motion in either direction by delivered pressurized hydraulic fluid from the driven hydrostatic pump;

(g) a pair of hydraulic conductors adapted to carry pressurized hydraulic fluid from the hydrostatic motor to the hydrostatic pump and a return flow from the hydrostatic motor to the hydrostatic pump;

(h) means for regulating the amount and direction of flow from the hydrostatic pump to the hydrostatic motor to rotate said motor in the desired direction and at a selected speed;

(i) a flexible drive adapted to connect the output of the hydrostatic motor to drive means provided on said single propeller shaft, and (j) means for disengaging the flexible drive from the hydrostatic motor to said propeller shaft when and while the main engine is operatively connected to the propeller shaft.

4,273,544

AQUATIC RECREATIONAL VEHICLES

Charles E. Smith, 7932 Eisenhower Blvd., Bridgeport, N.Y. 13030

Filed Dec. 22, 1978, Ser. No. 972,204

Int. Cl.³ B60F *3/00*

U.S. Cl. 440—30 **9 Claims**

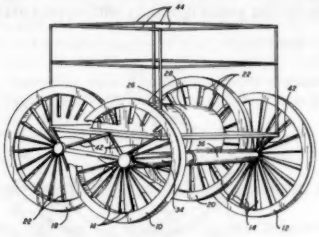
1. An aquatic recreational vehicle powered by one or more riders and comprising, in combination:

(a) at least one pair of forward wheels mounted on and rotatable by a common front axle;

(b) at least one pair of rear wheels mounted on and rotatable by a common rear axle;

(c) means providing sufficient buoyancy to support said vehicle and rider(s) upon a body of water;

(d) frame means connecting said front and rear axles;
(e) at least one sprocket on each of said front and rear axles for transmitting rotation thereto in at least one direction;



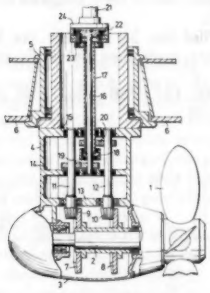
(f) at least one gear member supported relative to said frame means for rotation by said rider(s); and
(g) means for transmitting rotation of said gear member to both said sprockets.

4,273,545

MARINE PROPELLER UNIT

Anders L. Pehrsson, Kristinehamn, Sweden, assignor to Aktiebolaget Karlstads Mekaniska Werkstad, Karlstad, Sweden

Filed Sep. 25, 1979, Ser. No. 78,830
Claims priority, application Sweden, Oct. 2, 1978, 7810328
Int. Cl.³ B63H *23/00*
U.S. Cl. 440—75 **2 Claims**



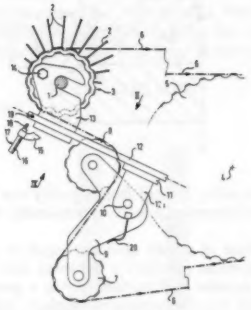
1. A marine propeller unit for mounting to an underside of a vessel, the unit comprising a propeller mounted on a horizontal propeller shaft, a gear housing in which said propeller shaft is journalled, a vertical hollow strut attached to and supporting said gear housing at its lower end and having its upper end adapted for connection to said underside of said vessel, a gearing system housed in said gear housing and connecting said propeller shaft to a transmission shaft system extending substantially vertically upwards from said gear housing through said hollow strut for connection to a drive machinery located within said vessel, said gearing system and said transmission shaft system including at least two conical gears mounted axially spaced on said propeller shaft, at least two mutually parallel, substantially vertical gear drive shafts journalled for rotation within said strut with their lower ends connected to respective ones of said conical gears, a first vertical transmission shaft having its lower end coupled to one of the gear drive shafts through a first cylindrical gear and extending upwards so as to have its upper end inside the vessel, and a tubular second vertical transmission shaft coaxially surrounding said first transmission shaft and having its lower end coupled to the other gear drive shaft through a second cylindrical gear and extending upwards so as to have its upper end close to the upper end of said first transmission shaft, said first and second transmission shafts having their upper ends coupled together so as to be driveable jointly and in the same direction of rotation from said drive machinery within the vessel.

4,273,546

BICYCLE CHAIN-SHIFTING DEVICE

Eduard Bergles, Graz, Austria, assignor to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Jul. 26, 1979, Ser. No. 61,065
Claims priority, application Fed. Rep. of Germany, Aug. 8, 1978, 2834646
Int. Cl.³ F16H *11/04*
U.S. Cl. 474—82 **19 Claims**



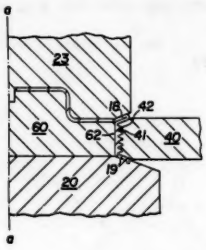
1. A chain-shifting device for a bicycle or the like comprising a frame, an axle mounted on said frame for supporting a driven wheel, a chain wheel unit including a plurality of chain wheels concentrically positioned relative to said axle, said chain wheels having different diameters and being arranged next to one another in the axial direction of said axle, a chain guide wheel, a movable support member rotatably supporting said chain guide wheel, said chain guide wheel being rotatable about an axis disposed in substantially parallel relation with said axle, a fixed support member attached to said frame, guide means supported on said fixed support member, said movable support member secured to said guide means for movement along a path substantially parallel to said axle, an adjusting switch having a plurality of switch positions corresponding at least to the number of said chain wheels, transmission means connected to and extending between said adjusting switch and said guide means for positioning said movable support member via said guide means along the path of movement of said movable support member, an endless chain engageable with said guide wheel and selectively engageable with said chain wheels on said chain wheel unit for driving said axle, said movable support member being locked in position when said chain engaged on said chain guide wheel is not moving, said adjusting switch being displaceable into another position when said movable support member is in the locked position, said guide means including readjustment means for moving said movable support member into another position corresponding to the changed position of said adjusting switch when said movable support member is released from the locked position when said chain commences to move over said chain guide wheel, wherein the improvement comprises that said guide means includes a linkage arrangement comprising a first linkage part connected to said movable support member, a second linkage part articulated at one end thereof to said first linkage part, said first and second linkage parts being movable relative to one another, a cam disc rotatably mounted on said second linkage part with said cam disc being rotatable between angularly spaced end positions, a cam disc follower attached to said first linkage part, and said readjustment means connected to said first linkage part for maintaining said cam disc follower in contact with said cam disc when said chain is moving.

4,273,547

METHOD OF PULLEY MANUFACTURE AND PRODUCT

Klaus K. Bytzek, Toronto, Canada, assignor to Drive Manufacturing Inc., Weston, Canada

Continuation of Ser. No. 850,356, Nov. 10, 1977, abandoned.
This application Sep. 17, 1979, Ser. No. 76,279
Claims priority, application Canada, Feb. 4, 1977, 271068
Int. Cl.[3] F16H *55/44;* B21K *1/42*
U.S. Cl. 474—170 13 Claims



1. A poly v pulley formed from a pulley can blank of sheet metal of a predetermined minimum permissible thickness comprising:

a circular base of a wall thickness equal to said predetermined minimum permissible thickness, and

an integral annular wall portion having a generally smooth cylindrical interior peripheral surface and an exterior peripheral surface shaped to operatively engage a poly v-belt,

said wall portion having a cross-sectional configuration defined by metal cold flow which is straight along its interior periphery and has a plurality of v grooves in its exterior periphery,

the distance between the trough of each v groove and said straight interior periphery being sufficient to provide required strength but less than the predetermined minimum thickness of said sheet metal can blank,

the cross-sectional area of said wall portion being greater than the cross-sectional area of a section of said sheet metal can blank of said predetermined thickness having a length equal to the axial extent of said wall portion whereby said pulley contains less metal and weighs less than a pulley with a similarly configured wall portion made from a can blank of the same metal having a thickness such that a length thereof equal to the axial extent of said wall portion has a cross-sectional area equal to or slightly greater than the cross-sectional area of said wall portion.

4,273,548

METHOD AND DEVICE FOR FOLDING BLANKS TO FORM BOXES

Walton B. Crane, Sherman Oaks, Calif., assignor to Industrial Designs & Services, Encino, Calif.

Filed Oct. 4, 1979, Ser. No. 81,633
Int. Cl.[3] B31B *1/26*
U.S. Cl. 493—162 19 Claims

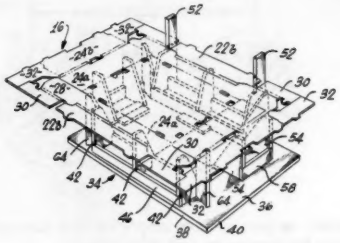
1. A jig for folding a blank having side panels, end panels, supplemental side panels attached to said end panels, and supplemental end panels attached to said side panels to form a paperboard box, said jig comprising:

a base;

side panel folding means arranged on opposite sides of said base and defining side folding surfaces that extend upwardly and outwardly from said base for engaging and folding said side panels;

end panel folding means arranged at opposite ends of said base and defining end folding surfaces that extend upwardly and outwardly from said base for engaging and folding said end panels, said end folding surfaces raising less steeply from said base than said side folding surfaces, whereby said side panels are folded upwardly before said end panels as said blank is pressed into said jig; and

corner guide means for engaging and folding said supplemental end panels upwardly with respect to the associated



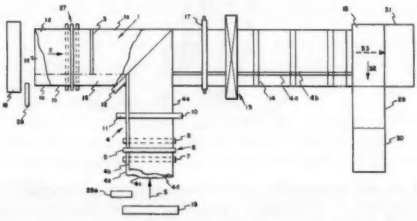
side panels prior to engagement of said side panels with side folding surfaces whereby said supplemental end panels are folded inwardly of said end panels, and for folding said supplemental side panels outwardly with respect to the associated end panels as said blank is pressed downwardly into said jig.

4,273,549

PROCESS FOR MAKING MULTI-WALLED PLASTIC BAG

Francesco Pezzana, Pregnana Milanese, and Cesare Quacquarella, Milan, both of Italy, assignors to W. R. Grace & Co., Duncan, S.C.

Filed Jun. 26, 1979, Ser. No. 52,171
Claims priority, application United Kingdom, Jun. 26, 1978, 27884/78
Int. Cl.[3] B31B *1/36, 23/60, 27/00*
U.S. Cl. 493—196 11 Claims



1. A process for manufacturing a plurality of multi-walled bags of a flexible plastic material comprising: taking a longitudinally folded flat web of a first flexible plastic film; at least partially opening superposed plies of said first flexible plastic film at a web margin opposite a fold line and establishing a relative movement between a corona discharge electrode and the first plastic film in a direction along the film to pre-treat at least a part of an inwardly facing surface of each of said superposed plies; taking a longitudinally folded flat web of a second flexible plastic film, a transverse dimension of said second flexible plastic film being less than a transverse dimension of said first flexible plastic film; pre-treating outwardly facing surfaces of two plies of said second flexible plastic film; passing a pre-treated web of said second flexible plastic film over a diverter guide into a space between the at least partially opened plies of said first flexible plastic film to bring a fold line of the second flexible plastic film between the said two plies of said flexible plastic film at least substantially into register with the fold line between the partially opened plies of said first

flexible plastic film with said two webs moving synchronously in a single direction; and sealing a composite of the two folded webs at a sealing station along a spaced seal line extending transversely of the said direction of movement of the two webs to form a plurality of open-ended bags having a bottom of each bag defined by said at least substantially registered fold lines of the two webs and a mouth region of each bag defined by said first flexible plastic film at a web margin opposite the fold lines in an area of dimension which is greater than a dimension of said second flexible plastic film whereby said mouth is defined only by said first flexible plastic film.

4,273,550

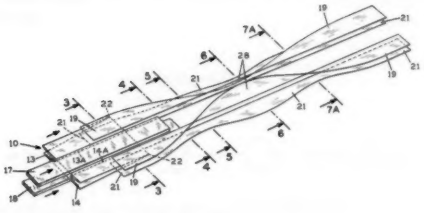
METHOD FOR PRODUCING A FLAT BOTTOM PLASTIC BAG

Ewald A. Kamp, Chicago, Ill., assignor to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 889,915, Mar. 24, 1978, abandoned. This application Aug. 30, 1979, Ser. No. 71,199

Int. Cl.³ B31B *1/42, 1/54, 1/80*

U.S. Cl. 493—240 **3 Claims**



1. A method of producing a flat-bottom bag from a thermo plastic heat sealable material which includes the steps of:

(a) providing a length of flattened, thermo plastic heat sealable tubular material having front and back walls and a central longitudinal region, said walls being united along each longitudinal edge by a gusset including a longitudinal gusset fold line, said length having been heat sealed transversely adjacent one extremity to provide a bag having a closed bottom and an open mouth;

(b) clamping the front and back walls in said central longitudinal region by directing said bag between two feed belts of lesser width than said central region;

(c) delivering a jet of air in between each of said gussets to separate opposing films of said gussets from each other;

(d) flaring the gussets until the position of the transverse heat seal common to the gusset coincides with the gusset fold line by directing a continuous force against said gussets while passing said gussets through a first path-conforming zone corresponding to the spreading of the gussets from substantially 0° to substantially 180°; and

(e) maintaining the fold line and heat seal in juxtaposition by application of a force directed against said fold line and said heat seal while returning the gussets to the non-flared position by directing said gussets through a second path-conforming zone corresponding to the merging of the gussets from substantially 180° to substantially 0° thus providing a gusset tuck disposed on each corner of said closed bottom.

4,273,551

DOUBLE-WALLED HOLLOW ROD OF FLEXIBLE TUBULAR MATERIAL

Armin Köstner, Wiesbaden; Richard Lenhart, Wiesbaden-Frauenstein, and Klaus-Jürgen Bittner, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 413,622, Nov. 7, 1973, abandoned. This application Jun. 9, 1978, Ser. No. 914,158

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1972, 2254731

Int. Cl.³ A22C *13/00*

U.S. Cl. 493—243 **4 Claims**

1. A process for the manufacture of a hollow tubular rod of flexible tubing having a coating on at least one of its surfaces which comprises:

(a) fitting a shirred stick of flexible tubing having a coating on at least one of its surfaces over a hollow former,

(b) sealing one end of the stick,

(c) pushing the sealed end of the shirred stick into the central orifice of the hollow former until the sealed end within the former is approximately inside the other end of the stick which lies on the outside of the former, such that a double-walled rod is formed, and

(d) withdrawing the double-walled rod from the former in the direction opposite to the direction in which the sealed end of the stick was pushed into the central orifice of the former.

4,273,552

PROCESS FOR THE PRETREATMENT OF CELLULOSE FIBERS TO BE PRINTED ACCORDING TO THE THERMOTRANSFER PRINTING METHOD

Ehrenfried Nischwitz, Schmitten, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

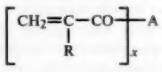
Filed Sep. 12, 1979, Ser. No. 75,328

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1978, 2840438

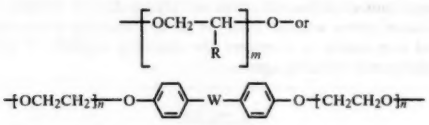
Int. Cl.[3] D06P *1/00*; B05D *3/02, 3/00*

U.S. Cl. 8—471 1 Claim

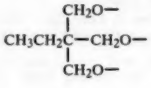
1. In a process for the thermotransfer printing of cellulose fibers, the improvement which consists of printing such cellulose fibers which have been treated prior to the printing by impregnating the fiber material with a solution or dispersion containing a compound of the formula



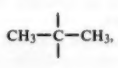
in which x is 2 or 3, A represents—if x=2—a group of the formula



or—if x=3—represents a group of the formula



W is a group of the formula —CH_2— or



R is hydrogen or methyl, m is a number of from 1 to 30, preferably from 4 to 11, and n is a number of from 1 to 30, preferably from 1 to 10, as well as a polymerization catalyst, and steaming and drying the material.

4,273,553

ANTHRAQUINONE REACTIVE DYESTUFFS

Wolfgang Harms; Horst Jäger; Klaus von Oertzen, and Klaus Wunderlich, all of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

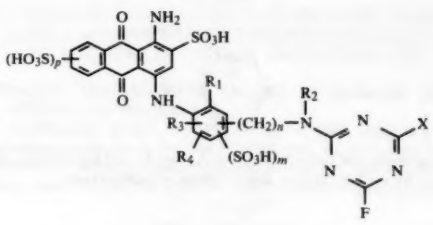
Filed Oct. 19, 1979, Ser. No. 86,615

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1978, 2848403; Nov. 24, 1978, 2850919

Int. Cl.[3] C09B *62/06*; C07D *251/00*

U.S. Cl. 8—549 5 Claims

1. Dyestuffs of the formula



wherein

R_1=C_1–C_4-alkyl or halogen,

R_2=H or C_1–C_4-alkyl,

R_3 and R_4=H, C_1–C_4-alkyl or halogen,

m, n and p=0 or 1 and

X=NH_2.

4,273,554

PROCESS FOR DYEING TEXTILE CELLULOSE MATERIAL WHICH HAS NOT BEEN PRE-CLEANED

Heinz Abel, Reinach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 31, 1979, Ser. No. 108,856

Claims priority, application Switzerland, Jan. 10, 1979, 218/79

Int. Cl.[3] C09B *67/00, 67/28*

U.S. Cl. 8—557 19 Claims

1. A process for dyeing cellulosic textile material, which has not been pre-cleaned, with a vat dye or an anionic dye, which comprises dyeing the cellulose in the presence of polymaleic acid with a molecular weight of 300 to 5,000 or of an anhydride or salt thereof.

4,273,555

AZO COMPOUNDS

Yasushi Yamada, Omiya; Hiroshi Ozawa, Koshigaya; Masae Gomi, Toda, and Hideshiro Nomura, Urawa, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

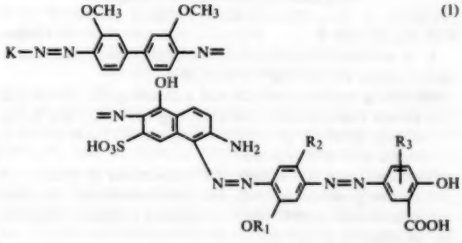
Filed Sep. 7, 1979, Ser. No. 73,426

Claims priority, application Japan, Sep. 22, 1978, 53-115992

Int. Cl.[3] C09B *27/00*

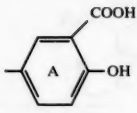
U.S. Cl. 8—673 7 Claims

1. An azo compound which, in the free acid form, is repesented by the following formula:

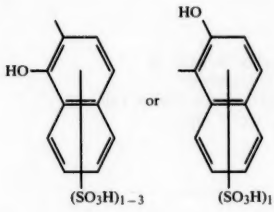


(1)

wherein R_1 stands for methyl or ethyl, R_2 stands for hydrogen, methyl, methoxy or ethoxy, R_3 stands for hydrogen or methyl, and K stands for

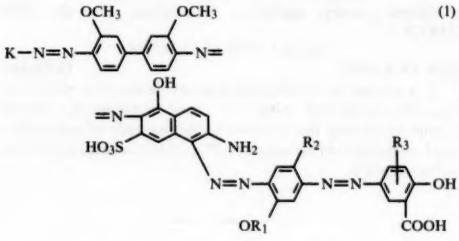


wherein the benzene nucleus A may be further substituted by methyl, amino, acetyl amino or methoxy; or



wherein these naphthalene nuclei may be further substituted by hydroxy, amino or acetylamino.

6. A method for dyeing cellulose fibers which comprises treating cellulose fibers with an azo compound which, in the free acid form, is represented by the following formula:



(1)

wherein R_1, R_2, R_3 and K are as defined in claim **1**, and subjecting the dyed cellulose fibers to a copper treatment.

4,273,556

DETERMINATION OF UREA

E. Melvin Gindler, Union City, Calif., assignor to Sherwood Medical Industries Inc., St. Louis, Mo.

Filed Dec. 19, 1979, Ser. No. 105,207
Int. Cl.³ G01N *33/62*
U.S. Cl. 23—230 B **19 Claims**

1. A method of determining the urea concentration of a liquid sample comprising the steps of:

(a) adding o-phthalaldehyde and a chromogenic compound to said liquid sample, said chromogenic compound being chosen from the group consisting essentially of chromotropic acid and its salts;

(b) maintaining said sample at a temperature at which said chromogenic compound, said o-phthalaldehyde and said urea in said sample react to produce a colored reaction product;

(c) obtaining a colorimetric absorbance reading for said sample; and

(d) comparing said absorbance reading with calibration means.

4,273,557

LIMULUS LYSATE PROCEDURE FOR DETERMINING ENDOTOXINS

David L. Juranas, St. Louis, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed Mar. 31, 1980, Ser. No. 135,810
Int. Cl.³ C12Q *1/00*; G01N *33/50*
U.S. Cl. 23—230 B **9 Claims**

1. In an in vitro test method for determining endotoxin under endotoxin determining conditions by Limulus amebocyte lysate in certain fluids selected from the group consisting of lipid emulsions for injection, parenterally administered sodium chloride solutions, lactated Ringer's solution, normal serum albumin, plasma protein fraction and anti-hemophilic factor USP which interferes with the reaction between any endotoxin present and said lysate thereby giving an improper determination, the improvement comprising conducting said method in the presence of (1) an interference reducing amount of a substantially linear polymeric water soluble interference reducing agent to reduce said interference, said agent having a molecular weight of at least 1000 selected from the group consisting of acrylic acid-acrylamide copolymer, acrylic acid—acrylonitrile copolymer, polyacrylic acid, alkali metal salts of polyacrylic acid, hydrolyzed polyacrylamide, alkali metal salts of hydrolyzed polyacrylamide, hydrolyzed polyacrylonitrile and alkali metal salts of polyacrylonitrile and (2) a sufficient amount of divalent cation selected from the group consisting of calcium and magnesium to overcome the chelating capacity of said interference reducing agent.

4,273,558

DETERMINATION OF TOTAL ORGANIC CARBON IN AN AQUEOUS SAMPLE CONTAINING HALIDE ION

Danny M. Mar, Daly City, Calif., assignor to Envirotech Corporation, Menlo Park, Calif.

Filed Mar. 7, 1980, Ser. No. 128,066
Int. Cl.³ G01N *33/18*
U.S. Cl. 23—230 PC **27 Claims**

1. A process for determining total organic carbon in an aqueous sample containing halide ion, said process comprising the steps of:

(a) preparing an aqueous solution containing an oxidizing agent and mercuric monohalide ion without forming an insoluble precipitate;

(b) introducing said sample into said solution;

(c) irradiating said solution and said sample with electromagnetic energy to oxidize organic matter in said sample to carbon dioxide;

(d) removing carbon dioxide produced by oxidation of said organic matter in said sample from said solution; and

(e) measuring total carbon in said carbon dioxide.

4,273,559

ELEMENTAL SUPERSELECTIVE GAS CHROMATOGRAPHIC DETECTION APPARATUS AND METHOD

Norvell J. Nelson, Palo Alto, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 822,584, Aug. 8, 1977, abandoned. This application Dec. 21, 1978, Ser. No. 972,089
Int. Cl.³ G01N *21/72, 27/66*
U.S. Cl. 23—232 E **5 Claims**

1. A method of element discrimination comprising:

maintaining a surface defining a boundary of a reaction zone at a first electrical potential relative to a second potential;

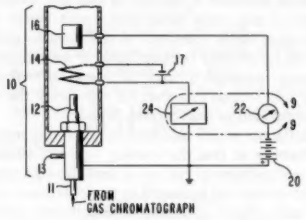
supplying a source of alkali metal vapor to said reaction zone;

introducing a sample gas from a flame tip member to said reaction zone, said flame tip member maintained at a reference potential;

introducing another gas to said reaction zone;

inducing selected reactions with said sample gas in said reactions zone;

collecting a plurality of ionic species at a second electrical potential to form a signal proportional to ionic current collected, said ionic species resulting from said reaction;



causing the sense of said ionic current to change for selected components thereof by adjusting of the electric potential distribution between said first potential and said second potential for discrimination between at least two ionic species; and

detecting the value and polarity of the ionic current as a function of the elemental constituents of said sample gas.

4,273,560

METHOD FOR OPERATING COMBUSTION DEVICES

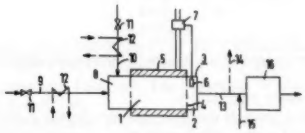
Hana Kostka, Nuremberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 20, 1979, Ser. No. 67,897

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1978, 2837899

Int. Cl.³ C01B *3/40*

U.S. Cl. 48—212 **11 Claims**



1. A method for the operation of a combustion device, comprising:

(a) mixing liquid hydrocarbons with air with an air number of from about 0.05 to about 0.3 resulting in the mixture with liquid hydrocarbons;

(b) contacting said mixture with shaped metal bodies, consisting essentially of an aluminum alloy containing from about 15 to about 35% silicon by weight, and at elevated temperature, to result in the production, by partial oxidation, of a soot-free fuel gas mixture containing carbon monoxide, gaseous hydrocarbons and hydrogen wherein after the contacting from about 5 to about 30% by weight, of the aluminum in said shaped metal bodies is in the form of α-Al_2O_3 and from about 1 to about 10% by weight of the silicon in said shaped metal bodies is in the form of β-SiC;

(c) mixing said fuel gas with additional air to form a fuel gas/air mixture; and

(d) conducting said fuel gas/air mixture to a device for the combustion thereof.

4,273,561

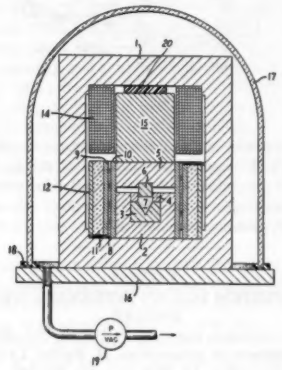
ULTRASHARP POLYCRYSTALLINE DIAMOND EDGES, POINTS, AND IMPROVED DIAMOND COMPOSITES, AND METHODS OF MAKING AND IRRADIATING SAME

Humberto Fernandez-Moran Villalobos, 55 Dartmouth Rd., Williams Bay, Wis. 53191

Continuation of Ser. No. 896,571, Apr. 4, 1978, which is a continuation-in-part of Ser. No. 852,022, Nov. 16, 1977, Pat. No. 4,164,680, which is a continuation-in-part of Ser. No. 608,260, Aug. 26, 1975, Pat. No. 4,084,942. This application Aug. 6, 1979, Ser. No. 63,685

Int. Cl.³ B24D *3/04*

U.S. Cl. 51—307 **24 Claims**



1. A method of producing a microprecision polycrystalline diamond implement which comprises:

preparing ultrafine particles of predominantly rhombohedral graphite having a particle size less than 100 Å,

placing a selected quantity of said graphite particles in a mold having a mold cavity of selected size and shape,

placing said mold in a gas-tight enclosure and evacuating said enclosure to produce therein an ultrahigh vacuum thoroughly to degas said graphite particles and mold, and

subjecting said graphite particles in said mold to pressure of the order of at least 80 Kb and temperature of 2000°-3000° K. in an ultrahigh vacuum or inert gas to convert said ultrafine graphite particles to ultrafine diamond particles and to mold and sinter said ultrafine diamond particles into a microprecision polycrystalline diamond implement of predetermined size and shape.

4,273,562

METHOD AND APPARATUS FOR PUMPING GASEOUS LIQUIDS AND SEPARATING THE GASEOUS COMPONENTS THEREFROM

Toivo Niskanen, Hamina, Finland, assignor to A. Ahlstrom Osakeyhtio, Noormarkku, Finland

Filed Oct. 1, 1979, Ser. No. 80,344

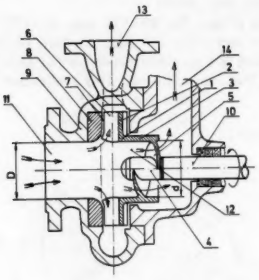
Int. Cl.³ B01D *19/00*; F03B *11/04*

U.S. Cl. 55—52 **4 Claims**

1. A method for pumping gaseous liquids in a centrifugal pump having a rotary impeller with vanes defining a first set of passages, and an opening through said impeller defining a second passage, which method comprises introducing into the pump an inflowing stream of gaseous liquid, dividing said inflowing stream at the impeller into two outflowing streams, one of said outflowing streams containing the greater part of the gaseous content of said inflowing stream and passing through said second passage, and the other of said outflowing streams passing through said first set of passages; and positively driving said one outflowing stream through said second

passage by a surface extending into said second passage and rotating with the impeller.

3. A centrifugal pump having a rotary impeller, an opening through said impeller defining a passage for the flow of a



gaseous fluid stream and an improved entrained gas separating structure, which improvement comprises means defining at least one surface connected to the impeller for rotation therewith and extending into said passage to positively drive therethrough such gaseous fluid stream.

4,273,563

COOLING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

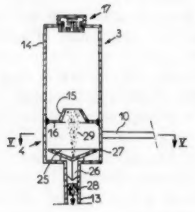
Jean Fadda, Chassieu, and Jean P. Pernet, Estrablin, both of France, assignors to Automobiles M. Berliet, Lyons, France

Filed Nov. 13, 1978, Ser. No. 959,910

Claims priority, application France, Nov. 10, 1977, 77 34522

Int. Cl.³ B01D *53/24*

U.S. Cl. 55—189 **10 Claims**



1. In combination with an internal combustion cooling system of the type having a radiator mounted in front of an engine, including passage means communicating the hot cooling fluid containing gases from the engine to the radiator, the fluid being cooled in the radiator and returning to the engine by way of an inlet opening in the water pump mounted to said engine, the improvement comprising:

a cylindrical expansion tank mounted in said passage means for receiving said cooling liquid containing gases from said engine and from said radiator, said cylindrical expansion tank further comprising separator means mounted in said expansion tank defining a first chamber degasification portion and a second chamber expansion portion, said separator means further comprising:

an internal wall mounted transverse to the axis of said cylindrical expansion tank between said first chamber degasification portion and said second chamber expansion portion, said internal wall having portions defining a central opening and at least one hole spaced away from said central opening; and

a truncated cone connected to said internal wall and covering said central opening, said cone having a wall tapering upwards from said internal wall;

inlet means tangentially mounted in said first chamber to said cylindrical expansion tank, said inlet means receiving said cooling liquid containing gases from said engine and from said radiator;

outlet means mounted to one end of said first chamber in the cylindrical expansion tank, said outlet means directing said cooling liquid contained in said tank to said passage means to return said cooling liquid to said engine;

valve means mounted to said outer end of said expansion tank in said second chamber for regulating the escape of gases contained in said cooling liquid;

conical deflector means mounted in said outlet means of the first chamber so that the cooling liquid containing gases enters said cylindrical expansion tank through said tangential inlet means and is caused to travel around the periphery of said cylindrical expansion tank thereby generating a vortex flow in said tank, said cooling liquid being able to pass around the peripheral conical edge of said deflector means such that the gases in said cooling liquid containing gases entering said tank are deflected by said deflector means toward said second chamber in said cylindrical tank; and

means for mounting said cylindrical expansion tank in said passage means of said internal combustion engine cooling system.

4,273,564

AIR CLEANER OF INTERNAL COMBUSTION ENGINES

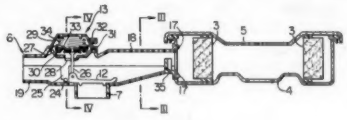
Hiromichi Sugie, Nagoya; Hajime Akado, Anjo, and Akira Yamashita, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 15, 1980, Ser. No. 140,593

Claims priority, application Japan, May 30, 1979, 54-72595[U]

Int. Cl.³ B01D *51/00*

U.S. Cl. 55—267 **5 Claims**



4. An air cleaner of an internal combustion engine comprising:

an air cleaner main body;

an air inlet conduit fitted to said air cleaner main body and provided with a diaphragm type vacuum motor, said air inlet conduit being formed of a synthetic resinous material and composed of an upper conduit portion and a lower conduit portion obtained by dividing said air inlet conduit longitudinally into two axially extending segments secured to each other;

a heated air inlet port formed integrally in said lower conduit portion;

a stepped flange formed integrally with said upper conduit portion to constitute a lower half portion of a housing of the vacuum motor;

a cap joined to said stepped flange, with an outer peripheral edge of a diaphragm of the vacuum motor being held therebetween, to constitute an upper half portion of the housing of the vacuum motor;

a valve body disposed so as to open and close said heated air inlet port and connected to the central portion of the diaphragm;

a recess and a notch formed at the bottom of said recess on the inner surface of either side wall of said lower conduit portion; and

a bearing member attached to the inner surface of either side

wall of said upper conduit portion and formed at its lower end with a notch complementary with said notch formed at the bottom of said recess of the lower conduit portion, said two notches cooperating with each other to provide a bearing which rotatably supports said valve body.

4,273,565

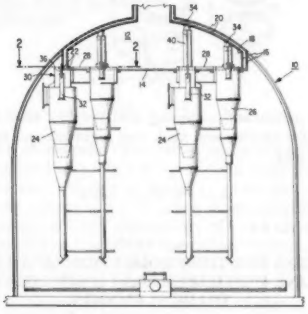
CYCLONE SUPPORT

Arthur C. Worley, Mt. Tabor, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 902,952, May 5, 1978, abandoned. This application Feb. 15, 1980, Ser. No. 122,232

Int. Cl.³ B01D *45/12*

U.S. Cl. 55—343 **5 Claims**



1. A vessel which is subjected to a high temperature differential, comprising a vessel head having a downward extending support skirt connected therewith and a plenum chamber at an end of said vessel adjacent said head; a plurality of separator stages mounted in said vessel; means located completely within said vessel including hanger strap means for separately and independently supporting each of said stages directly from said vessel head; and a relatively thin flexible plenum chamber floor having said skirt connected therewith and substantially supported only by said plurality of stages, wherein said hanger strap means extend through said floor.

4,273,566

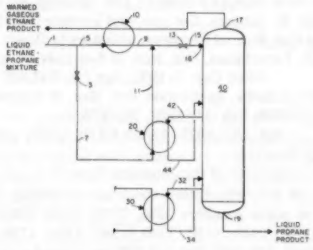
METHOD AND SYSTEM FOR THE FRACTIONATION OF ETHANE-PROPANE MIXTURES

Brian L. Schwarz, Pearland, Tex., assignor to Cabot Corporation, Kokomo, Ind.

Continuation-in-part of Ser. No. 939,460, Sep. 5, 1978, abandoned. This application Jun. 4, 1979, Ser. No. 44,976

Int. Cl.³ F25J *3/02*

U.S. Cl. 62—27 **7 Claims**



1. A method for the fractionation of ethane-propane mixtures which comprises the steps of:

(a) providing a relatively high pressure entirely liquid feed mixture consisting essentially of between 85 and 70 mole percent ethane and between 15 and 30 mole percent propane:

(b) dividing said liquid feed mixture into first and second feed mixture streams;

(c) cooling and reducing the pressure of said liquid feed mixture to a temperature sufficiently low to supply all of the refrigeration in the fractionation step of (d), below, and to a relatively low pressure whereat said mixture is maintained in an at least predominantly liquid state, thereby to provide all of the liquid for refluxing purpose in said fractionation step of (d), said first stream being precooled by heat exchange thereof with cold gaseous ethane fraction removed as overhead product from the fractionation tower of step (d), said second stream being precooled by heat exchange thereof with cold distilling liquid removed from the fractionation tower of step (d), said distilling liquid being recycled to the fractionation tower after warming and at least partial vaporization thereof by said second stream to thereby provide reboil heat to said tower, said cooling and pressure reduction being at least partially achieved by expansion cooling of said liquid feed mixture substantially immediately preceding said step (d);

(d) introducing the cooled pressure-reduced and at least predominantly liquid feed mixture of (c) into a fractionation tower wherein fractionation of the ethane component from said mixture is achieved at relatively low pressure;

(e) removing as overhead product from said fractionation tower, and without reflux condensation thereof, a cold gaseous ethane fraction having a propane content of no greater than about 10 mole percent; and

(f) removing as bottom product from said fractionation tower a liquid propane fraction having reduced ethane content.

4,273,567

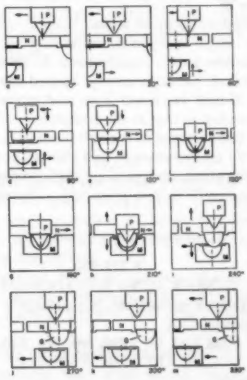
METHOD AND APPARATUS FOR FORMING GLASS PARISONS

John J. Scholl, Elmira, and Warren D. Staley, Painted Post, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Feb. 11, 1980, Ser. No. 120,352

Int. Cl.³ C03B *11/16*

U.S. Cl. 65—72 **41 Claims**



1. A method of forming glass parisons with a single mold and plunger set for retention by a plurality of successively presented retention means, which comprises, continuously moving a plurality of retention means along a predetermined path, positioning a mold in an initial position vertically below said predetermined path, delivering a charge of molten glass to said

mold, moving said mold in the direction of movement of said retention means at the same speed as that of said retention means so as to track vertically below one of said retention means, moving said mold vertically into operable engagement with said one retention means while continuing to track with the same, positioning a plunger vertically above said predetermined path for movement in the direction of said path, moving said plunger in the direction of movement of said retention means at the same speed as that of said retention means so as to track vertically above said one retention means simultaneously with the tracking of the mold with said retention means, moving said plunger vertically into operable pressing engagement with said one retention means while continuing to track with the same, pressing said charge of molten glass carried by said mold into a parison while said one retention means, said mold and said plunger move simultaneously along said predetermined path, vertically moving said mold and said plunger from operable engagement with said one retention means while simultaneously tracking with the same, retaining said newly press-formed parison with said retention means, moving said mold and plunger in a return direction opposite to the direction of movement of said retention means along said path to relative starting positions, and repeating the pressing cycle of said mold and plunger set with the next presented retention means.

36. Apparatus for forming glass articles which comprises, means for continuously moving a plurality of neck ring assemblies horizontally along a predetermined linear path, a single mold positioned below said linear path, a single plunger positioned above said linear path, means for moving said mold and said plunger into operable pressing engagement with each neck ring assembly successively presented along said path for press forming a glass article therewithin during continuous movement along said path from a charge of molten glass delivered to said mold, and said means for moving said mold and said plunger including cam actuated means programming the vertical and horizontal movement of said mold and said plunger for operable synchronous tracking engagement with each successively presented continuously moving neck ring assembly.

4,273,568

PRESS AND BLOW GLASS FORMING

John J. Scholl, Elmira, and Warren D. Staley, Painted Post, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Feb. 11, 1980, Ser. No. 120,353
Int. Cl.³ C03B *9/193*
U.S. Cl. 65—76 **12 Claims**

1. A method of forming a thin walled lightweight hollow glass article which comprises, delivering a charge of molten glass to a parison mold, rapidly press forming said charge to form a soft blank having a cavity formed therein, minimizing the amount of heat extracted from said molten charge during said press forming so that at the completion of said press forming the core temperature of the soft blank is substantially equal to the delivery temperature of said charge, controllably developing said soft blank, and blowing said developed blank into a finished lightweight hollow glass article having relatively thin walls.

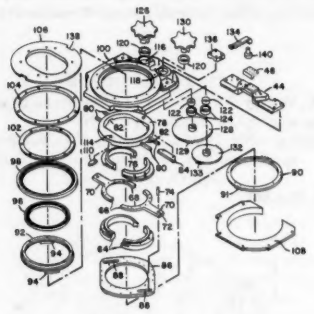
4,273,569

NECK RING MECHANISM

Warren D. Staley, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Feb. 11, 1980, Ser. No. 120,330
Int. Cl.³ C03B *9/325, 9/40*
U.S. Cl. 65—360 **18 Claims**

1. A neck ring mechanism for transporting, rotating and releasing a glass article which comprises, a neck ring housing, a neck ring rotatably mounted within said housing and comprising a plurality of neck ring segments, an inner bearing ring mounted for rotation within said housing, means slidably mounted with respect to said inner bearing ring and operatively retaining said neck ring segments for opening and closing the segments of said neck ring, rotatable cam means for actuating said slidably mounted means, and means for rotating



said cam means and camming said slidably mounted means inwardly for closing said neck ring segments and for rotating said neck ring.

4,273,570

PROCESS FOR THE PRODUCTION OF A LIQUID ALKALINE FERTILIZER CONTAINING CLAYS AND TRACE ELEMENTS

Josef Deubler, Ramsau Nr. 31, 4822 Bad Goisern, Austria

Filed Sep. 21, 1979, Ser. No. 77,828
Claims priority, application Austria, Mar. 30, 1978, 2258/78
Int. Cl.³ C05D *3/00*
U.S. Cl. 71—21 **17 Claims**

1. Process for the production of a liquid, alkaline fertilizer containing clays and trace elements, comprising the steps of

adding 30–40 parts by weight of ground Haselgebirge to 70–60 parts by weight of water, and

stirring or agitating this mixture for the production of a solution and suspension, respectively, for at least 30 minutes,

with continued stirring adding in the aqueous mixture per 1000 liters of mixture, 0.1 to 0.5 kg. of calcium carbide,

after gas generation has ended, continuing stirring at least one hour obtaining an alkaline fertilizer concentrate.

4,273,571

ORGANIC CHEMICAL COMPOUND, MICROBIOLOGICAL PROCESS FOR ITS PREPARATION, AND ITS USE AS A HERBICIDE

Dieter Berg; Werner Frommer; Delf Schmidt, all of Wuppertal; Robert R. Schmidt, Cologne, and Dietmar Schäfer, Marburg, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 8, 1978, Ser. No. 967,930
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1977, 2758008; Feb. 11, 1978, 2805855
Int. Cl.³ A01N *63/04;* **C12P** *13/00, 1/06*
U.S. Cl. 71—79 **6 Claims**

1. A compound of the empirical formula $C_{10}H_{14}N_6O_3$, having an IR KBr-absorption spectrum exhibiting characteristic bands at wave numbers 3340, 3170, 2920, 2040, 1660, 1600, 1570, 1520, 1480, 1430, 1380, 1340, 1295, 1250, 1215, 1160, 1110, 1030, 890, 860, 790 and 720 cm^{-1}, and a specific optical rotation at 1% in methanol at 20° C. of $-19.7°$.

5. A method of combating weeds which comprises applying to the weeds, or to a habitat thereof, a herbicidally effective amount of the compound according to claim **1**.

4,273,572
N-ALKYL OR ALKOXY-N'-SUBSTITUTED HYDROCARBYL UREA

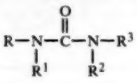
Malcolm S. Singer, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 919,016, Jun. 26, 1978, Pat. No. 4,200,450, which is a division of Ser. No. 741,422, Nov. 12, 1976, Pat. No. 4,111,683, which is a continuation-in-part of Ser. No. 591,058, Jun. 27, 1975, abandoned, which is a continuation of Ser. No. 385,521, Aug. 3, 1973, abandoned, which is a continuation-in-part of Ser. No. 124,422, Mar. 16, 1971, abandoned, and Ser. No. 124,423, Mar. 16, 1971, abandoned. This application Aug. 20, 1979, Ser. No. 68,039

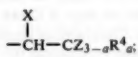
Int. Cl.³ A01N *57/30;* C07F *9/24*

U.S. Cl. 71—86 **9 Claims**

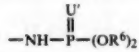
1. A compound of the formula



wherein R is an aromatic hydrocarbyl group of 6 to 12 carbon atoms substituted with 0 to 5 halogen atoms of atomic number 9 to 35 (fluorine, chlorine or bromine), nitro, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, or 0 to 1 alkylsulfoxy of 1 to 4 carbon atoms, alkylsulfonyl of 1 to 4 carbon atoms, trifluoromethyl, phenoxy, phenylthio, phenylsulfoxy, phenylsulfonyl, the phenoxy, phenylthio, phenylsulfoxy or phenylsulfonyl being substituted on the aromatic nucleus with 0 to 5 halogens of atomic number 9 to 35 or alkyl of 1 to 4 carbon atoms; R^1 is hydrogen or alkyl of 1 to 4 carbon atoms, R^2 is alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms and R^3 is



wherein a is 0 to 1 and R^4 is hydrogen or CW'_3, W' representing hydrogen or halogen of atomic number 9 to 35, Z is halogen of atomic number 9 to 35, and X is



wherein U' is 0 or S, and R^6 is alkyl of 1 to 4 carbon atoms.

4,273,573
AGENTS FOR REGULATING PLANT GROWTH USING 2-THIAZOLONE-5-CARBOXYLIC ACID COMPOUNDS

Klaus Grohe, Odenthal, and Klaus Lürssen, Bergisch-Gladbach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

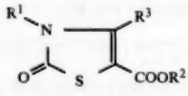
Filed Apr. 4, 1979, Ser. No. 26,850

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1978, 2818504

Int. Cl.³ A01N *43/78*

U.S. Cl. 71—90 **31 Claims**

1. Method for regulating the growth of plants, comprising applying to the plants or their habitat effective amounts of a 2-thiazolone-5-carboxylic acid compound of the formula



(I)

in which

R^1 is hydrogen;

alkyl of from 1 to 4 carbon atoms;

alkoxyalkyl of from 1 to 4 carbon atoms in each alkyl moiety;

alkyl of 1 to 4 carbon atoms substituted by phenylcarbonyl

aryl of 6 to 10 carbon atoms optionally substituted with halogen; arylalkyl of 6 to 10 carbon atoms in the aryl moiety and 1 to 4 carbon atoms in the alkyl moiety; or the radical

wherein

R^4 is straight or branched alkyl of up to 6 carbon atoms and

R^5 is straight or branched alkyl of 1 to 6 carbon atoms,

R^2 is hydrogen;

alkyl of up to 16 carbon atoms optionally substituted by cycloalkyl of 5 to 7 ring carbon atoms, alkoxy of 1 to 4 carbon atoms, phenoxy, or cyano; cycloalkyl of 5 to 7 ring carbon atoms optionally substituted by alkyl of 1 to 4 carbon atoms; aralkyl of 6 carbon atoms in the aryl moiety and 1 to 4 carbon atoms in the alkyl moiety;

R^3 is hydrogen,

alkyl of up to 4 carbon atoms;

alkoxyalkyl of 1 to 4 carbon atoms in each alkyl moiety;

haloalkyl of 1 to 4 carbon atoms.

4,273,574
2-[3-(4-CHLOROPHENOXY)PROPYLTHIO]-5-(1,3,3-TRIMETHYLUREIDO)-1,3,4-THIADIAZOLE AND USE AS A POST-EMERGENT HERBICIDE

Joel L. Kirkpatrick, Washington Crossing, Pa., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Aug. 14, 1980, Ser. No. 178,240

Int. Cl.³ A01N *43/82;* C07D *285/12*

U.S. Cl. 71—90 **6 Claims**

1. 2-[3-(4-Chlorophenoxy)propylthio]-5-(1,3,3-trimethylureido)-1,3,4-thiadiazole.

2. A herbicidal formulation which comprises from 0.1 percent to 95 percent by weight of the compound of claim 1 in combination with from 0.1 to 75 percent by weight of a carrier or surface active agent.

4,273,575
PROCESS FOR TRANSFORMING FINES OF IRON OR MANGANESE INTO RAW-MATERIAL FOR SINTERING

Bernardo C. Litzinger, and Udo F. M. Schmeling, both of Rio de Janeiro, Brazil, assignors to Mineracoes Brasileiras Reunidas S.A., Rio de Janeiro, Brazil

Filed Mar. 27, 1979, Ser. No. 24,400

Claims priority, application Brazil, Mar. 31, 1978, 7802010

Int. Cl.³ C22B *1/243, 1/244*

U.S. Cl. 75—3 **3 Claims**

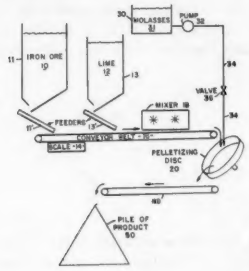
1. A process from transforming ore fines having a substantial proportion of particles with sizes below 150 microns into raw-material for a sintering process that produces raw material for steel-making furnaces, comprising the steps of:

mixing an iron ore fine with a lime agglomerant, the proportion of lime being 5% by weight;

adding 3% by weight of cane molasses to the mixture;

pelletizing the mixture to form micro-pellets having a diameter of less than 6 mm;

curing the micro-pellets in a closed environment at temperatures below 300° C. for a period sufficient to harden the



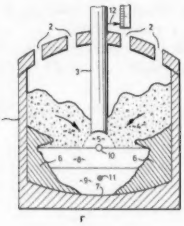
pellets to such an extent that they are resistant to size degradation due to handling.

4,273,576

ELECTRIC ARC FURNACE OPERATION

James H. Corrigan, Bonao, Dominican Republic, and Egil J. Jahnsen, Vaagsbygd, Norway, assignors to Falconbridge Nickel Mines Limited, Canada

Filed Feb. 14, 1980, Ser. No. 121,510
Claims priority, application Canada, Feb. 16, 1979, 321687
Int. Cl.³ C21C 5/52
U.S. Cl. 75—11 **2 Claims**



1. In the method of conducting the continuous shielded arc melting of particulate material containing metal values and a preponderence of slag-making constituents including silica and magnesia, by establishing, in an electric arc furnace having a refractory lining and a given hearth area, a bath resulting from the said melting of particulate material overlying the bath and a protective crust of solidified bath material and unmelted particulate material between the refractory lining and the bath, whereby a major portion of the electrical energy supplied to the furnace is released in the shielded arc and a minor portion of said energy is released in the bath, the improvement comprising,

(a) determining, by slag weight and bath level measurements, the rate of change of bath volume coincident with a measured rate of change of bath level in the furnace,

(b) dividing the rate of change of bath volume by that of bath level to obtain an active bath area, and

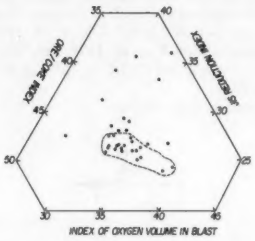
(c) adjusting the ratio of energy released in the arc to that released in the bath, by regulating the fraction of the total power fed to the bath, to maintain a predetermined active bath area.

4,273,577

BLAST-FURNACE OPERATION METHOD

Isao Fujita, Takarazuka; Nobuyuki Imanishi, Kobe; Tadao Tsutaya, Kobe; Ryo Watanabe, Kobe, and Takao Kawai, Kobe, all of Japan, assignors to Kobe Steel, Limited, Kobe, Japan

Filed Aug. 22, 1979, Ser. No. 68,582
Claims priority, application Japan, Aug. 28, 1978, 53-104558
Int. Cl.³ C21B 5/00
U.S. Cl. 75—41 **9 Claims**



1. A method for the efficient operation of a blast furnace comprising:

selecting oxygen volume in blast (x), ore/coke (Y) and reducibility of burden materials (Z) from among factors which affect heat input and heat output in the furnace; plotting a graph having a center axis (Y Axis) representing ore/coke, an axis (X axis) representing oxygen volume in blast and an axis (Z axis) representing reducibility of burden materials, the X axis and the Z axis being located in parallel on the left and right sides of the Y axis; plotting on said graph values of the three factors which represent data of efficiently operated blast furnaces; determining from the plot of the data an angle θ downwardly subtended on the central axis by straight lines drawn to the point on the central axis from the two points on the neighboring axes according to the relation

$$\theta = 180° + \theta_x + \theta_z \quad (1);$$

and controlling at least one of the three factors according to the equation

$$\theta_x O_z + \tan^{-1} f(X,Y) + \tan^{-1} g(Y,Z) \quad (2)$$

wherein θ_x and O_z are angles subtended toward the point on the Y axis from points on the X and Z axes with respect to a straight line drawn at right angles to the three axes through a point on the Y axis wherein the points represent the operational values of the furnace, f(X,Y) represents a function of X and Y determined by a regression equation of X-Y obtained from the data of efficiently operated blast furnaces and the distance between the X and Y axes, and g(Y,Z) represents a function of Y and Z determined by a regression equation of Y-Z obtained from the data of efficiency operated blast furnaces and the distance between the Y and Z axes, so that the value of θ for the furnace is within a suitable range of values determined from the data.

4,273,578

METHOD FOR RECOVERING RHODIUM

Paul Nesvadba, Nidderau, and Gisela Weigl, Rodenbach, both of Fed. Rep. of Germany, assignors to W. C. Heraeus GmbH, Hanau, Fed. Rep. of Germany

Filed Mar. 17, 1980, Ser. No. 130,644
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1979, 2911193
Int. Cl.³ C22B 11/00; C01G 55/00
U.S. Cl. 75—83 **11 Claims**

1. A process for recovering rhodium from a residue of the oxo synthesis or of a hydroformylation which comprises contacting at a temperature of 60° to 140° C. said residue with sulfur or a compound which under the reaction conditions

splits off sulfur whereby there is formed a rhodium-containing precipitate and separating the resultant rhodium-containing precipitate from said residue.

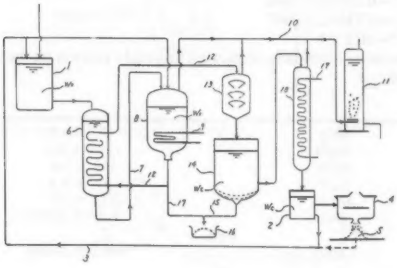
6. A process according to claim 1, wherein the so-separated rhodium-containing precipitate is thereafter converted to rhodium or a rhodium compound.

7. A process according to claim 6, wherein the rhodium precipitate is smelted with pyrosulfate, common salt or lead to give rhodium and/or a rhodium compound.

4,273,579
PROCESS FOR TREATING LIQUID CONTAINING AU-CN COMPOUND

Michihide Okugawa, and Ryougi Ishii, both of Hyogo, Japan, assignors to Dainichi-Nippon Cables, Ltd., Hyogo, Japan

Filed Mar. 27, 1980, Ser. No. 134,688
Claims priority, application Japan, Mar. 28, 1979, 54-37616
Int. Cl.³ C22B *11/04, 11/08*
U.S. Cl. 75—106 **6 Claims**



1. A process for treating a liquid containing an Au-CN compound characterized in that the liquid is heated at a temperature of at least 170° C. in the presence of at least 0.1 mole of a water-soluble metallic hydroxide per gram atom of the gold in the Au-CN compound to recover gold.

4,273,580
REINFORCED JACKET CROWN AND METHOD OF CONSTRUCTION

Itzhak Shoher, 50 Shlomo Hamelech St., Tel Aviv, and Aharon E. Whiteman, 13 J1 Perez St., Petach Tikvah, both of Israel

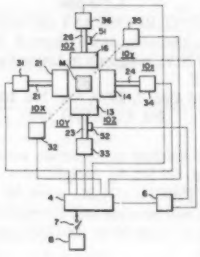
Filed Apr. 4, 1979, Ser. No. 26,785
Int. Cl.³ C22C *5/02*; B22F *7/08*
U.S. Cl. 75—165 **10 Claims**

1. A reinforced porcelain jacket crown restoration comprising a composite body including a thin metal foil of platinum conforming in shape to the tooth preparation to be restored, at least one thin intermediate coating of a predetermined composition of finely divided particles bonded to said thin metal foil at an elevated sintering temperature above at least 1600° F.; said composition comprising, from about 1 to 100% by weight of a noble metal chloride with said noble metal being selected from the group consisting of gold, silver, palladium and platinum in combination with from zero to 99% by weight of a gold based noble metal; and a relatively thick fired on outer coating of dental porcelain.

4,273,581
SINTERING METHOD

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Kanagawa, Japan

Filed Apr. 6, 1979, Ser. No. 27,662
Claims priority, application Japan, Apr. 7, 1978, 53-40193; Apr. 24, 1978, 53-47902; Sep. 18, 1978, 53-113644; Oct. 4, 1978, 53-121466; Oct. 17, 1978, 53-128144
Int. Cl.³ B22F *3/16*
U.S. Cl. 75—214 **7 Claims**



1. A method of sintering a mass of particulate material, comprising the steps of:

applying a first pressure to said mass in a first direction;

applying a second pressure of said mass in a second direction which is transverse to said first direction;

applying a third pressure to said mass in a third direction which is transverse to said first and second directions; and

successively modifying at least two of said first, second and third pressures to said mass cyclically while said mass is heated at a sintering temperature.

4,273,582
PROCESS FOR THE MANUFACTURE OF SINTERED METAL BODIES, IN PARTICULAR BATTERY ELECTRODES

Manfred A. Gutjahr, Wendlingen, and Hans Heinrich, Esslingen, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Apr. 5, 1977, Ser. No. 784,774
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1976, 2615779
Int. Cl.³ B22F *1/00*
U.S. Cl. 75—222 **33 Claims**

1. A process for the manufacture of sintered metal bodies comprising mixing a powdered metal or metal alloy with at least one pore-forming filler, said filler being a fine grain salt or mixture of salts, filling a mold with said mixture, heating the uncompressed mixture to the sintering temperature of the metal or metal alloy, reducing the pressure of the atmosphere surrounding said mold during said heating, the salt of said mixture being vaporizable under the conditions of sintering, said salt of the mixture being selected such that significant vaporization thereof occurs only after sintering of the metal has begun, continuing such heat and reduced pressure for a period of time sufficient to vaporize substantially all of said salt and sinter the metal or alloy into a porous body, and recovering the porous sintered metal.

4,273,583

FLAKE SILVER POWDERS WITH CHEMISORBED MONOLAYER OF DISPERSANT

Leo W. Tyran, Lewiston, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 29, 1979, Ser. No. 53,197
Int. Cl.[3] B22F 1/02
U.S. Cl. 75—251 6 Claims

1. A flake silver powder consisting essentially of silver particles having at least a partial chemisorbed monolayer of hydrophobic organic dispersing agent on the particle surfaces wherein said dispersing agent contains at least one olefinic unsaturation and at least one carboxylic acid group and wherein said dispersing agent comprises 0.2–0.5% by weight of the powder.

4,273,584

DETERGENT RESISTANT COMPOSITIONS

Paul F. D'Angelo, Ossining, and Richard B. Metzler, Briar Cliff Manor, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 7, 1979, Ser. No. 100,990
Int. Cl.[3] C09G 1/00
U.S. Cl. 106—3 6 Claims

1. A detergent resistant composition which comprises

I. from 35% to 99.5% by weight of a component of the formula $HO[Si(CH_3)_2O]_xH$, wherein x is a numerical value which will provide said component with a viscosity in the range of from 10 to 100,000 centistokes at ambient temperature,

II. from 0.8% to 75% by weight of a component of the formula

$$(RO)_{3-a}R_a'SiC_3H_6N[C_2H_4N]_yC_3H_6SiR_b'(OR)_{3-b}$$
$$\qquad\qquad\quad |\qquad\quad |$$
$$\qquad\qquad\quad X\qquad X$$

wherein R and R' are alkyl groups of from one to eight carbons, a and b have values of zero and one, y has a value of from zero to twenty, and X is hydrogen or an organotrialkoxysilyl group of the formula —L—$Si(OR)_3$ wherein R is as defined above and L is $-C_3H_6-$ or $-CH_2.CHOHCH_2C_3H_6-$, and

III. from 0.5% to 65% by weight of a component of the formula $(RO)_3SiZ$ or a component of the formula

$$\begin{array}{c} Z\quad Z\quad\ \ Z \\ |\quad\ |\quad\ \ | \\ (RO)_2SiO(SiO)_xSi(OR)_2 \\ \quad\ \ | \\ \quad OR \end{array}$$

wherein R is an alkyl group of from one to eight carbons, x has a value of from 0 to 100, and Z is a nonhydrolyzable aliphatic group containing up to ten carbon atoms.

4,273,585

SEALING GLASS

David A. Krohn, Milford; Elias Snitzer, West Hartford, and Peter E. Raber, Milford, all of Conn., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Apr. 21, 1980, Ser. No. 142,038
Int. Cl.[3] C03C 3/14
U.S. Cl. 106—47 R 2 Claims

1. A sealing glass composition having a thermal coefficient of expansion (from room temperature to 300° C.) of about $90\times10-7$/°C. and a softening temperature of about 406° C., consisting essentially of the following ingredients in the following proportions:

Pbo	66%
B_2O_3	18%
ZnO	15%
Fining Agent	1%

4,273,586

TINTED GLASSWARE

James E. Flannery; David W. Morgan, both of Corning; Sara E. Rosplock, Campbell, all of N.Y., and Stella A. Sczerbaniewicz, Inwood, W. Va., assignors to Corning Glass Works, Corning, N.Y.

Filed Jun. 23, 1980, Ser. No. 161,760
Int. Cl.[3] C03C 3/04
U.S. Cl. 106—52 2 Claims

1. A transparent glass which, after thermal tempering, exhibits the following C.I.E. chromaticity coordinates and transmission utilizing Illuminant C

$x=0.3300\pm0.0040$
$y=0.3360\pm0.0040$
$Y=60.8\pm4$

consisting essentially, expressed in weight percent on the oxide basis, of

SiO_2	75 ±2.0
Na_2O	13.45 ± 0.5
Al_2O_3	165 ± 0.2
CaO	9.6 ± 0.3
As_2O_3	0.15 ± 0.1
NiO	0.03 ± 0.005
with	
Cr_2O_3	0.002 ± 0.0005
or	
CuO	0.005 ± 0.002

4,273,587

POLYCRYSTALLINE TRANSPARENT SPINEL SINTERED BODY AND A METHOD FOR PRODUCING THE SAME

Isao Oda, Nagoya; Masayuki Kaneno, Tokoname, and Issei Hayakawa, Tsushima, all of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Aug. 8, 1979, Ser. No. 64,841
Claims priority, application Japan, Aug. 14, 1978, 53-98947
Int. Cl.[3] C04B 35/44
U.S. Cl. 106—73.4 3 Claims

1. A polycrystalline transparent spinel sintered body consisting mainly of Al_2O_3 and MgO in a molar ratio of Al_2O_3/MgO of ranging from 0.52/0.48 to 0.70/0.30, and containing 0.001-0.1% by weight of LiF.

4,273,588

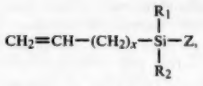
ASPHALT COMPOSITIONS MODIFIED WITH ORGANO SILANE COMPOUNDS

Alfred Marzocchi; Michael G. Roberts, and Charles E. Bolen, all of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

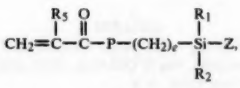
Division of Ser. No. 66,207, Aug. 13, 1979, which is a continuation-in-part of Ser. No. 852,772, Nov. 18, 1977, abandoned. This application Mar. 24, 1980, Ser. No. 133,169
Int. Cl.[3] C08L 95/00
U.S. Cl. 106—273 N 2 Claims

1. A silicon-modified bitumen composition prepared by reaction of (1) a bitumen chemically modified with a modifying agent selected from the group consisting of, ammonia and an amine, said amine having the formula $R_3—NH—R_4$ or $H_2N—(CH_2)y\ NH—(CH_2)_z—NH]_aH$ wherein R_3 is a C_1–C_{10} alkyl, R_4 is hydrogen or a C_1–C_{10} alkyl, y is an integer from 2 to 6, z is an integer from 2 to 6 and a is 0 or an integer from 1

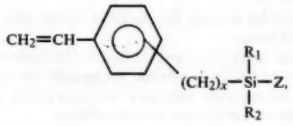
to 6 and (2) an organo silicon compound selected from the group consisting of a compound having the formula:



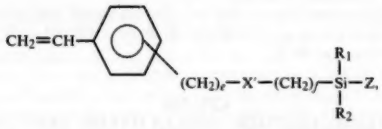
a compound having the formula:



a compound having the formula:



and a compound having the formula:



wherein x is 0 or an integer from 1-3, Z is a readily hydrolyzable group; R_1 and R_2 are selected from the group consisting of Z and a non-hydrolyzable organic group; R_5 is hydrogen or methyl; P is 0 or —NH—; e is an integer from 2-6, X' is —NH— or —NH—$(CH_2)_3$—NH— and f is an integer from 2 to 6 and the hydrolysis products of said organo silicon compound, in the presence of a catalyst to promote the reaction between the ethylenic unsaturation of said organo silicon compound with ethylenic unsaturation in the bitumen.

4,273,589

PRECIPITATED SILICIC ACID, METHOD AND COMPOSITIONS CONTAINING SAME

Peter Nauroth, Wesseling; Heinz Esch, Wesseling-Urfeld; Robert Kuhlmann, Erftstadt; Rudolf Bode, Bad Orb; Arthur Reisert, Kahl; Harald Bühler, and Günter Türk, both of Hanau, all of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 810,441, Jun. 27, 1977, abandoned. This application Jul. 31, 1979, Ser. No. 62,397

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1976, 2628975

Int. Cl.³ C09C *1/30*

U.S. Cl. 106—308 Q **8 Claims**

1. Hydrophobic silicic acid having the following properties:

BET surface acc. to DIN 66 131	m^2/g	110 ± 30
Average size of the primary particles from EM pictures	nm	15–22
Loss after drying acc. to DIN 55 921 after 2 hours at 105° C.	%	<2.5
Loss at red heat (related to the substance dried for 2 hours at 105° C.) acc. to DIN 55 921	%	5.5 ± 1.5
pH value (in 5% aqueous dispersion) acc. to DIN 53 200		7 ± 1
Conductivity (in 4% aqueous dispersion)	µS	600
Tamped density of the unaerated substance acc. to DIN 53 194	g/l	50 ± 20
Water wettability		<0.05
Carbon content	%	2.5 ± 0.6
Water absorption at 30° C. & 30% RM	%	1.2 ± 0.4
at 30° C. & 70%	%	1.5 ± 0.5
DBP adsorption	%	260 ± 30

said hydrophobic silicic acid having been prepared from a precipitated silicic acid by treating and agitating said silicic acid with a hydrophobic agent in a ratio of 10:0.5 to 10:3 followed by tempering for 60 to 180 minutes at a temperature of 200° C. to 400° C. and grinding to form a finely divided product, and said precipitated silicic acid having the following properties:

BET surface acc. to DIN 66 131	m^2/g	150 ± 30
Average size of the primary particles from EM pictures	nm	15–22
Loss after drying acc. to DIN 55 921 after 2 hours at 150° C.	%	2.5–3.5
Loss at red heat (related to the substance dried for 2 hours at 105° C.) acc. to DIN 55 921	%	3 ± 0.5
pH value (in 5% aqueous dispersion) acc. to DIN 53 200		3.5–5.5
Conductivity (in 5% aqueous dispersion)	µS	<500
Tamped density of the unaerated substance acc. to DIN 53 194	g/l	60 ± 20
SO_3 content (related to the substance dried for 2 hours at 105° C.)	%	<0.3
Na_2O content (related to the substance dried for 2 hours at 105° C.)	%	<0.3

4,273,590

PROCESS FOR OBTAINING PRESSED BEET PULP WITH HIGH DRY-SUBSTANCE CONTENT

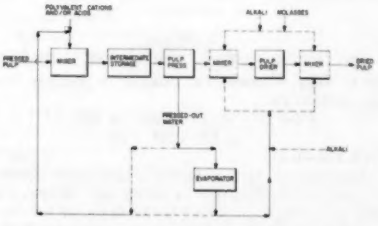
Theodor Cronewitz, and Hubert Schiweck, both of Worms, Fed. Rep. of Germany, assignors to Suddeutsche Zucker-Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

Filed Feb. 19, 1980, Ser. No. 122,259

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1979, 2906528

Int. Cl.³ C13D *1/08;* **B30B** *13/00*

U.S. Cl. 127—44 **18 Claims**



1. Process for obtaining beet pulp of high dry-solids content from a sugar extraction process, comprising:

mechanically pressing the pulp to produce pressed pulp;

mixing the pressed pulp with a solution of a material selected

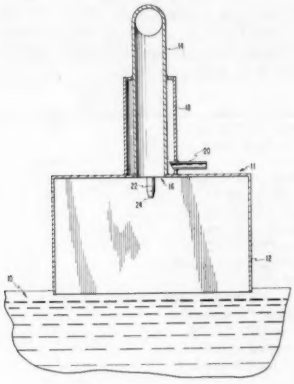
from the group consisting of salts of polyvalent cations, acids and mixtures thereof to lower the pH;
mechanically pressing the admixture;
recycling at least a portion of press water from the second pressing step to form said solution; and
thermally drying the pressed admixture.

4,273,591

METHOD AND APPARATUS FOR PREVENTION OF CLOGGING OF EXHAUST SYSTEMS

William G. Wood, Grosse Pointe Farms, and John F. Pilznienski, Dearborn Heights, both of Mich., assignors to Kolene Corp, Detroit, Mich.

Filed Oct. 5, 1979, Ser. No. 82,020
Int. Cl.³ B08B *9/02*
U.S. Cl. 134—11 **9 Claims**



7. In a method of preventing the build up of material in a device for adding solvent solutions of a chemical to an essentially solvent free fused bath of a chemical composition by spraying the solvent solution onto the bath. and wherein the bath has sufficient heat to vaporize the solvent and which device includes wall means defining a solvent exhaust system having a hood, an exhaust duct communicating with said hood, and fluid conducting means disposed to deliver the solvent solution to be sprayed onto the fused bath under the hood, the improvement which comprises providing fluid tight jacket means surrounding said exhaust system in the region where said exhaust duct and said hood communicate, said fluid tight jacket means being in heat conducting relationship with said exhaust system, and passing cooling fluid through said jacket at a temperature below the boiling point of the solvent whereby to condense solvent onto the walls of the exhaust system to thereby dissolve and remove splattered chemical composition on the duct wall.

4,273,592

COATING SOLUTION FOR METAL SURFACES

Timm L. Kelly, Oreland, Pa., assignor to Amchem Products, Inc., Ambler, Pa.

Filed Dec. 26, 1979, Ser. No. 107,017
Int. Cl.³ C23F *7/06*
U.S. Cl. 148—6.27 **64 Claims**

1. An aluminum surface having a uniformly colorless and clear coating which is free of boron and phosphate and is capable of turning light golden brown to purple in color when heated at a temperature of 900° F. for 5 minutes, but which resists blackening for at least 5 minutes when heated in water having a temperature within the range of about 140° F. to about 170° F., said coated aluminum surface having been obtained by contacting such aluminum surface with an acidic aqueous coating solution having a pH within the range of about 3.0 to about 5.0 and consisting essentially of at least about 0.5×10^{-3} moles/liter of zirconium or hafnium or a mixture thereof, at least about 0.025×10^{-3} moles/liter of a polyhydroxy compound having no more than 7 carbon atoms, and at least sufficient fluoride to combine with and form a soluble complex with all of the zirconium and hafnium present in the solution, wherein said polyhydroxy compound is selected from the group consisting of gluconic acid, a salt of gluconic acid, sorbitol, mannitol, dextrose, ethylene glycol, glycerine, and glucoheptonate.

4,273,593

METAL-JOINING PASTE AND VEHICLE THEREFOR

Albert J. Mastrangelo, North Olmsted, Ohio, assignor to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 52,063, Jun. 25, 1979. This application Jan. 22, 1980, Ser. No. 114,235
Int. Cl.³ B23K *35/34*
U.S. Cl. 148—24 **15 Claims**

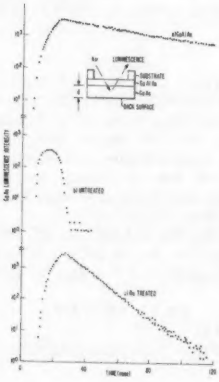
1. A vehicle for a metal-joining paste composition comprising in weight parts:
0.1–10 parts hydroxypropyl cellulose, the concentration of said hydroxypropyl cellulose being sufficient for imparting initial apparent viscosity between about 5,000 and about 50,000 centipoises to said vehicle;
1–20 parts selected from the group consisting of glycerine, water, and mixtures thereof;
0–50 parts of fluxing agent;
0–3 parts surfactant; and
55–99 parts of a mixture of polyalkoxyalkanols, said composition being a solvent for its hydroxypropyl cellulose content at 50° C.

4,273,594

GALLIUM ARSENIDE DEVICES HAVING REDUCED SURFACE RECOMBINATION VELOCITY

Adam Heller, Bridgewater; Harry J. Leamy, Summit; Barry Miller, New Providence; Ronald J. Nelson, Berkeley Heights, all of N.J., and Bruce A. Parkinson, Ames, Iowa, assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 5, 1979, Ser. No. 82,002
Int. Cl.³ H01L *31/04, 21/306*
U.S. Cl. 148—33.3 **6 Claims**



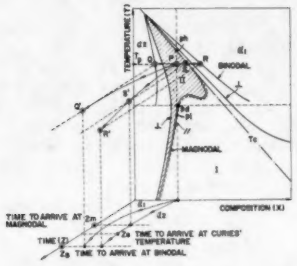
1. A semiconductor device containing n-type GaAs, said n-type GaAs having a surface, a layer of material disposed on said surface, characterized in that said surface further contains material selected from the group consisting of ruthenium, rhodium, nickel, iridium and lead, said material being present in an amount equivalent to greater than one-hundredth of a monolayer and less than one monolayer.

4,273,595

METHOD OF PREPARING THERMOMAGNETICALLY TREATED MAGNETICALLY ANISOTROPIC OBJECTS

Kiyoshi Inoue, Tokyo, and Hideo Kaneko, Wakabayashi, both of Japan, assignors to Inoue-Japax Research Incorporated, Kanagawaken, Japan

Filed Feb. 5, 1980, Ser. No. 118,792
Claims priority, application Japan, Mar. 19, 1979, 54-32649
Int. Cl.[3] C21D *1/04*
U.S. Cl. 148—103 5 Claims



1. A method of producing a magnetically anisotropic object from a spinodal decomposition-type alloy system wherein a homogeneous α phase is spinodally decomposable into an isomorphous structure of a ferromagnetic α_1 phase and a paramagnetic α_2 phase in a magnetic field, said method comprising the steps of: establishing a formula expressed as a function of temperature and composition for the total free energy of said alloy system and expressed as a sum of the chemical free energy of said alloy system and an additional term, said chemical free energy being resolved into a nonmagnetic component and a magnetic component thereof, said additional term being constituted by a free energy of magnetization of said alloy system and expressed with an intensity of said magnetic field taken as a parameter; calculating spinodal of said alloy system from said free energy formula by obtaining the locus of disappearance of a second derivative thereof to yield a first spinodal component applicable in parallel with the direction of said magnetic field and a second spinodal component applicable perpendicular to the direction of said magnetic field; drawing as curves said first and second spinodal components along with a curve representing the Curie's temperature of said alloy system in a phase diagram to establish an area therein defined by said first and second spinodal curves in conjunction with said Curie's temperature curve; and thermomagnetically treating said alloy system within said area.

4,273,596

METHOD OF PREPARING A MONOLITHIC INTRINSIC INFRARED FOCAL PLANE CHARGE COUPLED DEVICE IMAGER

William A. Gutierrez, Woodbridge, and John H. Pollard, Alexandria, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

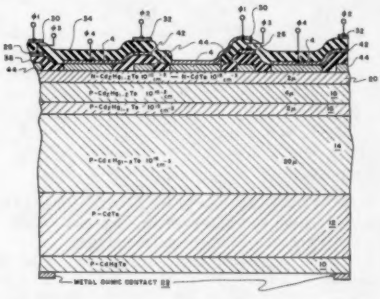
Division of Ser. No. 948,129, Oct. 3, 1978, Pat. No. 4,228,365. This application Jan. 2, 1980, Ser. No. 109,025
Int. Cl.[3] H01L *21/368, 21/82, 27/14*
U.S. Cl. 148—171 4 Claims

1. A method of preparing a monolithic intrinsic IR focal plane array CCD imager having a simple fabrication compatible with LSI technology; the steps of said method comprising:

providing a p-type, low resistivity single crystal wafer window substrate layer having an input side and an output side;

seeding the growth of four layers on said output side by using said p-type, low resistivity single crystal wafer window substrate layer in which said substrate layer furnishes the seed for said four layers, growing a p-doped wide band spillover layer on said window substrate layer, growing a p-doped narrow band absorber layer on said spillover layer, growing a p-doped transfer layer on said absorber layer, said transfer layer forming a heterojunction with said absorber layer and said transfer layer and absorber layer being lattice matched with proper bandgap, thickness and doping types and levels for efficient injection across said heterojunction, and growing an n-doped channel layer on said transfer layer;

forming a CCD gate structure on said channel layer wherein said step of forming a CCD gate structure comprises deposition on said channel layer a plurality of Schottky barrier gates designated **1**, **2**, **3**, and **4** and a plurality of channel stops separating rows of said Schottky barrier gates **1**, **2**, **3**, and **4** and next depositing a first insulator



layer between said plurality of channel stops and said Schottky barrier gates and depositing a first metallization forming first and second metal layers over said first insulator layer wherein said second metal layer is connected to Schottky barrier gate **4** and said first metal layers is connected to Schottky barrier gate **3** and depositing a second insulator layer over said first metallization and the remaining bare area of said first insulator layer then depositing a second metallization forming third and fourth metal layers over said second insulator layer wherein said third metal layer is connected to Schottky barrier gate **1** and said fourth metal layer is connected to Schottky barrier gate **2**;

depositing a p-doped optical filter over said input side of said substrate layer; and

depositing a metal ohmic contact on a portion of said p-doped optical filter.

4,273,597

FLUIDIZED POWDER FILLING OF CABLE CORE UNITS

John N. Garner, Pointe Claire, and Arthur S. Hayes, Kingston, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

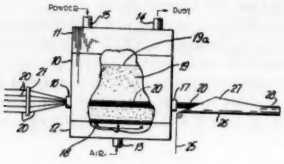
Continuation-in-part of Ser. No. 921,252, Jul. 3, 1978, abandoned. This application Sep. 11, 1979, Ser. No. 74,492
Int. Cl.[3] H01B *13/06*
U.S. Cl. 156—48 12 Claims

1. A method of powder filling cable core units having a plurality of conductors, said method comprising:

fluidizing a bed of said powder to form a fluidized bed with a defined upper surface; and

with the conductors of the cable core unit devoid of any surface covering which would prevent passage of powder between them, passing the core unit through the fluidized bed and beneath its defined upper surface with the conductors of the core unit substantially closed together, the fluidized powder in the bed flowing between the conductors to fill voids within the unit while avoiding attracting the powder to the conductors electrostatically.

6. Apparatus for powder filling cable core unit comprising:
a housing having a bottom and inlet and outlet ends;
at least one inlet for a core unit at said inlet end and at least one outlet for a core unit at the outlet end with the conductors substantially closed together;
a porous member located within the housing and extending across the housing at a level below the inlet and outlet;



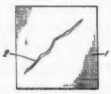
a fluidizable bed of filling powder supported by the porous member; and
means for feeding air through the porous member and into the powder to fluidize the powder, the quantity of powder being sufficient to produce a fluidized bed with a defined upper surface above the inlet and the outlet.

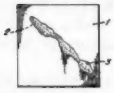
4,273,598

METHODS OF MAKING ADHESIVE BONDS

Malcolm R. Bowditch, Broadstone, England, assignor to The Secretary of State in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed May 18, 1979, Ser. No. 40,106
Claims priority, application United Kingdom, Jan. 20, 1977, 2419/77
Int. Cl.³ E04B *2/00;* **B29H** *19/00;* **B29C** *17/00;* **B22P** *19/10;* **B29C** *27/22*
U.S. Cl. 156—94 **8 Claims**





1. A method of making an adhesive bond to a substrate in the presence of water, the method comprising the steps of
impregnating a compliant synthetic foam carrier material having an open-celled structure with a thermosetting resinous adhesive,
applying the impregnated carrier material to the substrate,
compressing the impregnated carrier material against the substrate whereby initially the resinous adhesive causes bulk water to be displaced, absorbed or otherwise eliminated from the substrate to which the bond is to be made and the resinous adhesive is thereafter immobilized within the interstices of the carrier material and cures to form a strong bond with the substrate.

4,273,599

PROCESS FOR REINFORCING POLYVINYL CHLORIDE PIPE BY WRAPPING WITH GLASS FIBERS COATED WITH A POLYESTER RESIN COMPOSITION

Frederick A. Butt, Croton, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 866,140, Dec. 30, 1977, Pat. No. 4,189,452. This application Jul. 2, 1979, Ser. No. 54,329
Int. Cl.³ B65C *54/64*
U.S. Cl. 156—172 **5 Claims**

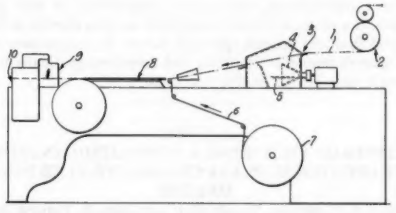
1. A process for reinforcing polyvinylchloride pipe, comprising:
(a) coating glass fibers with a liquid resin composition consisting essentially of:
(i) a first polyester of diethylene glycol, neopentyl glycol, maleic acid or anhydride and isophthalic acid,
(ii) a second polyester of propylene glycol, maleic acid or anhydride and isophthalic acid,
(iii) a monomer copolymerizable with said polyesters, and
(iv) an initiator for inducing copolymerization of said monomer with said polyesters;
(b) winding the resin-coated glass fibers around the exterior of said pipe to make direct contact of said resin composition with said pipe; and
(c) then permitting the resin composition to cure, thereby forming a bond between said pipe and the reinforcing glass fibers wound thereabout.

4,273,600

BONDING FIBRILLATED POLYPROPYLENE SMOKE FILTER WITH ETHYLENE-VINYLACETATE EMULSION

John A. Luke, Romsey, England, assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Continuation-in-part of Ser. No. 877,153, Feb. 13, 1978, abandoned, which is a continuation of Ser. No. 703,392, Jul. 8, 1976, abandoned. This application Jul. 26, 1979, Ser. No. 61,144
Claims priority, application United Kingdom, Jul. 11, 1975, 29261/75
Int. Cl.³ A24C *5/50*
U.S. Cl. 156—180 **2 Claims**

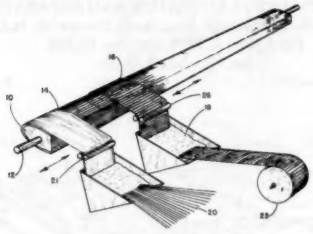


1. A method of making tobacco smoke filter rod from crimped fibrillated fibres of polypropylene, which comprises: spreading a tow of the fibres by passing the tow through a tow processing unit; applying to the spread (fibres) tow a cold-setting bonding agent comprising an emulsion of ethylene-vinyl acetate co-polymer, which emulsion has a viscosity in the range of 10 to 200 centipoise and a solids content in the range of 30 to 60 percent by weight and is applied to the tow in the form of a curtain of droplets, said emulsion being applied to the two in the form of a curtain of droplets by means of a spinning shear cone rotating at a speed of the order of 4,000 r.p.m.; and forming the fibres with the applied bonding agent into a filter rod without applying heat to set the bonding agent.

4,273,601
METHOD FOR THE PRODUCTION OF ELONGATED RESIN IMPREGNATED FILAMENT COMPOSITE STRUCTURES

Oscar Weingart, Riverside, Calif., assignor to Structural Composites Industries, Inc., Azusa, Calif.

Filed Oct. 31, 1977, Ser. No. 847,041
Int. Cl.³ B65H *81/00, 81/08*
U.S. Cl. 156—189 **9 Claims**



1. The method of winding an elongated hollow blade or spar having a longitudinal axis extending from a root portion to a tip portion and subject when in use to aerodynamic loading including cylical bending comprising the steps of:

wrapping successive overlapping helical convolutions of thermosetting synthetic resin and tape on an elongated mandrel while advancing tape from one end region of the mandrel to the other;

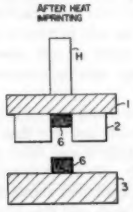
said tape carrying said resin and comprising short parallel high tensile strength filaments selected from the group consisting of glass, polyaramide, carbon, graphite or boron, lying transversely to the length of said tape, supported by continuous warp threads which constitute less than about five percent of the weight of the tape;

parallelogram distorting said tape during winding whereby said filaments lie at an angle of less than 30 degrees with respect to the longitudinal axis of the mandrel and finished spar said successive convolutions overlapped about 50% in the direction of the mandrel longitudinal axis.

4,273,602
HEAT-SENSITIVE RECORDING MATERIAL

Takao Kosaka, and Tahara, Yukio, both of Takasago, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Feb. 6, 1979, Ser. No. 10,043
Claims priority, application Japan, Feb. 7, 1978, 53-12637
Int. Cl.³ B41M *5/18*
U.S. Cl. 156—234 **11 Claims**

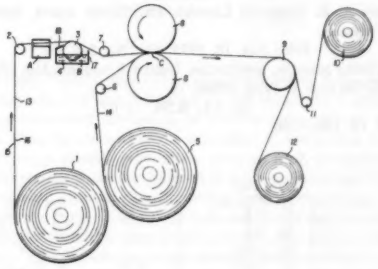


11. A method for recording images which comprises providing an imprinting-transferring type heat-sensitive recording material which comprises a support sheet of 5–40μ in thickness having thereon a transferable heat-sensitive chromogenic layer comprising a phenolic material, a colorless or pale-colored chromogenic material which reacts with said phenolic material upon application of heat to form color and heat fusible material having a melting point of 40°–150° C. and an image receiving sheet having thereon an image receiving layer containing a receiving agent having tackiness upon application of heat thereon, which is bonded by application of pressure onto the support sheet in such a manner that said heat sensitive chromogenic layer and said image receiving layer are in contact with each other, said heat fusible material being one which (1) increases the sensitivity of the chromogenic material for color formation, (2) bonds the support sheet to the receiving sheet and (3) transfers the heat-imposed portions of the transfer layer, heat-imprinting this recording material and then separating the two sheets to transfer the heat-imprinted images to the image receiving sheet.

4,273,603
PROCESS FOR TRANSFER OF A MAGNETIC LAYER FROM A TEMPORARY TO A PERMANENT SUPPORT

Roland Peronnet, Limeil Brevannes; Bernard Couturier, Varennes Jarcy, and Christian Fombert, Champigny, all of France, assignors to La Societe Pyral, Creteil, France

Filed Oct. 10, 1978, Ser. No. 950,032
Claims priority, application France, Oct. 21, 1977, 77 31700
Int. Cl.³ B32B *31/20, 31/08*
U.S. Cl. 156—236 **12 Claims**



1. A cold transfer process for transferring a magnetic layer from a temporary support to a permanent support film which comprises applying a magnetic layer comprising finely divided magnetic particles uniformly dispersed throughout a resin binder onto a temporary support film; wetting the magnetic layer with an organic liquid solvent which is capable of softening the resin binder but will not dissolve the resin binder such that the layer will readily separate from the temporary support; bringing the wet and softened magnetic layer into pressure contact with said final support to thereby transfer the magnetic layer from said temporary support to said final support.

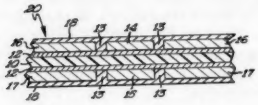
4,273,604
HEAT BONDING DEVICE

Orin B. Johnston, 5548 W. 78th St., Edina, Minn. 55435

Continuation-in-part of Ser. No. 827,668, Aug. 25, 1977, abandoned, which is a continuation-in-part of Ser. No. 697,746, Jun. 21, 1976, abandoned, which is a continuation of Ser. No. 499,449, Aug. 22, 1974, Pat. No. 3,964,958, which is a continuation-in-part of Ser. No. 326,534, Jan. 24, 1973, abandoned. This application Sep. 6, 1979, Ser. No. 73,147
Int. Cl.³ B29C *17/00*
U.S. Cl. 156—382 **6 Claims**

1. In apparatus for joining heat bondable materials by the application of heat and pressure along a predetermined seam area by means of a flexible diaphragm one side of which is pressed by fluid pressure which flexes its material engaging side convexly against the materials, said diaphragm comprising a web carrying permanently bonded thereto on its non-material pressing side a flexible heating element adapted to

apply heat through the web to said area while the diaphragm is so pressed and heat dissipating means carried by the web for dissipating heat from the diaphragm and the materials in the area adjacent the seam area, the improvement wherein said



web carries on its material pressing side heat directing means having a configuration corresponding to the desired seam configuration and located opposite said heating element for directing heat therefrom to the seam area.

4,273,605

INTERNAL LINING AND SEALING OF HOLLOW DUCTS

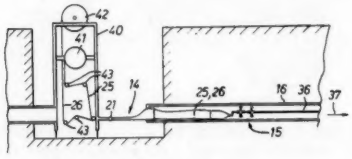
Louis A. R. Ross, 54 Llanvair Dr., South Ascot, Berkshire, England

Filed Jan. 13, 1975, Ser. No. 540,386

Claims priority, application United Kingdom, Jan. 21, 1974, 2824/74; Sep. 4, 1974, 38688/74

Int. Cl.³ B29C *17/07*

U.S. Cl. 156—286 **2 Claims**



1. A method for in situ lining of the interior sidewall of a long, buried length of pipeline with an imperforate, flexible lining tube, comprising the steps of:

(a) introducing an imperforate flexible lining tube into the length of pipeline in a collapsed state so that it lies throughout the length of said interior sidewall of said length of pipeline, step (a) being conducted by superimposing said tube in a collapsed state, upon an underlay and pulling a leading portion of this composite along through the length of pipeline, until said collapsed tube lies upon the underlay throughout said length of pipeline with approximately half of the exterior surface thereof presented upwardly;

(b) sealing the ends of the tube perimetrically to said length of pipeline at both ends of said length of pipeline, but providing an exhaust port from the space between the outside of the tube and said interior sidewall at one said end and an inflation port into the lumen of the tube at the opposite said end of said pipeline length;

(c) partially exhausting said space between the outside of the tube and said interior sidewall;

(d) progressively expanding the tube into intimate contact with said length of pipeline in an even manner, by:

(i) continuing to conduct step (c) upon said space, by drawing a partial vacuum via said exhaust port; and simultaneously

(ii) admitting an inflation gas such as air into said lumen through said inflation port;

further comprising a step of applying an adhesive upon said upwardly presented half of the collapsed tube before conducting step (b), the amount of distribution of this adhesive as applied being at least sufficient to, as a consequence of conducting step (d) and setting of said adhesive, approximately the upper half of exterior of the tube is facially secured to about the upper half of the interior sidewall of the length of pipeline.

4,273,606

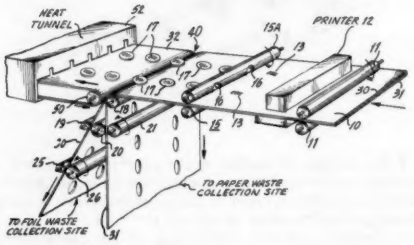
COMBINATION LAMINATOR AND SEPARATOR

Pasquale Trilli, 2700 Linder Ave., North Brunswick, N.J. 08902

Filed Nov. 1, 1979, Ser. No. 90,318

Int. Cl.³ B32B *31/18*

U.S. Cl. 156—388 **8 Claims**



1. A laminator and separator apparatus for making articles from a composite laminate sheet formed of a thick paper backing sheet covered by a thinner metallic foil sheet with a heat curable adhesive located between said foil and paper sheets, comprising:

(a) a pair of pressure rollers through which said composite laminate sheet moves with said foil sheet facing upwards with said sheet moving in a linear path,

(b) a rotary printing means in said path and operative to print indicia in discrete regions on said foil sheet,

(c) a rotary die cutter for cutting a pattern in said laminate sheet with said pattern surrounding said indicia and indicative of said article,

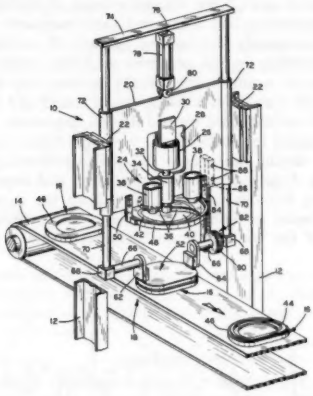
(d) a main roller located in said linear path and adapted to receive said composite sheet,

(e) a conveyor roller located in said path and separated from said main roller by a predetermined distance, a conveyor belt encircling said conveyor roller,

(f) a first and a second roller each having their surfaces coacting and located parallel to said main roller and positioned beneath the same with solely said thick paper backing sheet directed between said rollers, said first and second rollers of a given diameter and adapted to exert a downward force on said paper backing sheet, to cause said article as defined by said pattern to traverse said distance for directing the same to said conveyor belt, with said paper backing sheet moving downwardly towards a first collection site,

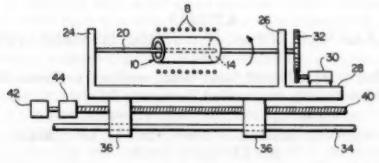
(g) a guide roller of a diameter less than one half the diameter of said main roller and less than the diameters of said first and second rollers and fabricated from a material which is relatively soft as compared to said first roller, said guide roller positioned above said first roller and in contact therewith with said thin foil sheet directed solely between said guide roller and said first roller to direct said foil sheet in a path transverse to said paper sheet to a second collection site, whereby said paper sheet and said foil sheets are separated and directed to separate locations, and another coacting pair of rollers located a predetermined distance from said guide roller and within the path of said foil sheet, with said sheet of foil passing between said pair of coacting rollers.

4,273,607
APPARATUS FOR APPLYING GASKET-FORMING MATERIAL
William A. Paul, 1808 Parkside Blvd., Toledo, Ohio 43607
Filed Nov. 1, 1979, Ser. No. 90,466
Int. Cl.[3] B44C *1/00*
U.S. Cl. 156—540 14 Claims



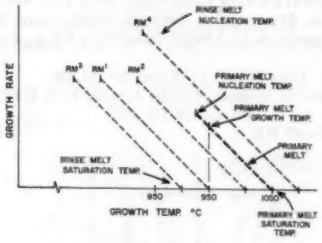
1. Apparatus for applying a bead of gasket-forming material in a pattern of predetermined size and shape to a mateable surface of a workpiece, said apparatus comprising a source of gasket-forming material, a transfer pad having at least one transfer surface conforming to the mateable surface of the workpiece to which the bead of gasket-forming material is to be applied, said transfer surface being wider than the bead of gasket-forming material and larger than the overall size of the pattern of the material so as to be capable of being used with patterns of the gasket-forming material in a variety of sizes and shapes, applicator means for applying gasket-forming material to said transfer surface of said pad from said source in the shape of the bead to be applied to the mateable surface, means for supporting the workpiece, and means for moving said transfer pad from a position with the transfer surface adjacent the mateable surface of the workpiece when on said support to a position with the transfer surface adjacent said applicator means.

4,273,608
METHOD OF FORMING A SHEET OF SINGLE CRYSTAL SEMICONDUCTOR MATERIAL
Allen L. Kerlin, 1009 Adrienne Dr., Alamo, Calif. 94507
Filed Jan. 4, 1979, Ser. No. 990
Int. Cl.[3] C30B *11/08, 29/00*
U.S. Cl. 156—605 11 Claims



1. The method of forming a sheet of crystalline semiconductor material comprising the steps of
providing a rotatable container having a generally cylindrical interior surface,
placing material in said container,
spinning and heating said container at a temperature above the melting point of said material whereby all material is liquid, and
slowly cooling said container beginning at one end thereof whereby said material solidifies directionally as a thin layer confined by said interior surface.

4,273,609
RINSE MELT FOR LPE CRYSTALS
Gary L. Nelson, Eagan, and William A. Harvey, Minneapolis, both of Minn., assignors to Sperry Corporation, New York, N.Y.
Filed Oct. 25, 1978, Ser. No. 954,511
Int. Cl.[3] C30B *19/02*
U.S. Cl. 156—624 10 Claims



1. In a liquid phase epitaxial process for growing a magnetic garnet crystal on a supporting garnet substrate from a garnet phase, primary melt, comprised of a solute and a solvent, at a growth temperature within the saturation to nucleation temperature range of said garnet phase, primary melt, an improvement therein for solvating adhered primary melt residue from the epitaxially grown magnetic garnet crystal comprising:
preparing a garnet phase, rinse melt mixture having a solvent different from that used in said primary melt and a saturation to nucleation temperature range which includes said growth temperature;
heating said garnet phase, rinse melt mixture to a temperature within the common range of the saturation to nucleation temperature ranges of said respective primary melt and said rinse melt mixture, thereby producing a rinse melt; and
immersing said epitaxially grown magnetic garnet crystal, upon withdrawal from said primary melt and while said magnetic garnet crystal is approximately at said growth temperature, in said rinse melt until said adhered primary melt residue is solvated from said epitaxially grown magnetic garnet crystal.

4,273,610
METHOD FOR CONTROLLING THE RESONANCE FREQUENCY OF YTTRIUM IRON GARNET FILMS
Howard L. Glass, Orange, and Michael T. Elliott, Cypress, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Sep. 11, 1979, Ser. No. 74,263
Int. Cl.[3] B32B *0/00*
U.S. Cl. 156—624 1 Claim

1. A method for controlling the resonance frequency of a liquid phase epitaxy grown, single crystal, yttrium iron garnet film through the incorporation of lead as a partial substituent for the yttrium component of said film which comprises the steps of:
(a) forming a molten flux consisting essentially of 1278.8 grams of PbO, 23.737 grams of B_2O_3, 84.712 grams of Fe_2O_3 and 5.989 grams of Y_2O_3;
(b) maintaining said flux at a growth temperature of from about 819.0° to 884° centigrade while simultaneously

immersing a [111] crytal oriented gadollnum gallium garnet substrate into said flux for a period of time sufficient to effect the deposition of a single crystal, lead substituted, yttrium iron garnet thin film on to the surface of said substrate such that said lead substituted component is present in an amount of up to about three weight percent; and

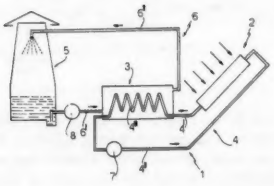
(c) removing said film covered substrate from said molten flux, whereby said film is characterized by a resonance frequency ranging from a minimum value of 2558 Oe to a maximum value of 2601 Oe.

4,273,611

METHOD FOR TREATING A SPENT EMULSION OF OIL IN WATER USED IN AN INDUSTRIAL PROCESS, AND THE APPARATUS FOR CARRYING OUT THE METHOD

Pietro Blasio, Florence, and Maurizio Talini, Lucca, both of Italy, assignors to Le Metalli Industrialle S.p.A., Florence, Italy

Filed Jul. 27, 1979, Ser. No. 61,256
Claims priority, application Italy, Jan. 30, 1979, 67196 A/79
Int. Cl.³ B01D *1/00*
U.S. Cl. 159—47 WL **5 Claims**



1. A method for treating a spent emulsion of oil in water used in an industrial process, in particular an emulsion of cutting oil in water, comprising at least one stage in which heat energy is supplied continuously to said emulsion for evaporating a predetermined quantity of the water contained therein and to raise the concentration of said oil in the emulsion to a value such as to enable this latter to be burnt in an industrial burner, said heat energy being at least partly provided by utilising solar energy, and further comprising at least one stage of burning the emulsion of said oil concentration in a burner in an industrial or heating plant.

4,273,612

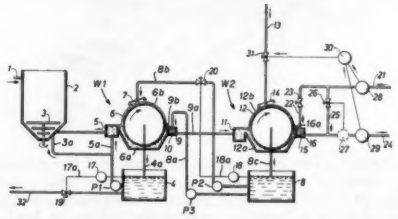
PROCESS AND APPARATUS FOR CONTINUOUSLY WASHING AQUEOUS FIBROUS SUSPENSIONS AND CONTROLLING THE VOLUME OF WASH LIQUID

Per A. R. Hillstrom, Domsjo, and Lars G. Norehall, Ornskoldsvik, both of Sweden, assignors to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden

Continuation of Ser. No. 785,487, Apr. 7, 1977, abandoned. This application Jun. 8, 1979, Ser. No. 46,742
Claims priority, application Sweden, Apr. 14, 1976, 7604430
The portion of the term of this patent subsequent to Feb. 6, 1996, has been disclaimed.
Int. Cl.³ D21C *9/02*
U.S. Cl. 162—49 **9 Claims**

1. A process for continuously washing fibrous suspensions having a varying consistency in aqueous suspending liquors containing dissolved impurities, dissolving said impurities by exchanging aqueous suspending liquid for the aqueous suspending liquor containing impurities, while controlling the dilution of the washed fibrous suspension that is obtained, which comprises in a continuous flow washing system having at least one washing stage washing fibrous material of the suspension with aqueous suspending liquid substantially free from dissolved impurities; and forming a washed fibrous suspension in said aqueous suspending liquid substantially free from dissolved impurities; separating from the washed fibrous suspension and withdrawing and recirculating back to a washing stage aqueous suspending washing liquid containing dissolved impurities washed out from the fibrous suspension; diluting the washed fibrous suspension from the washing stage by adding aqueous suspending liquid substantially free from dissolved impurities to the washed fibrous suspension; measuring (1) the volume amount of diluting aqueous suspending liquid added; and (2) the volume amount of diluted washed fibrous suspension; and then using these measured values to adjust continuously the volume amount of washing liquid added according to the consistency of the washed fibrous suspension, to maintain substantially constant any difference between the amount of washing liquid added and the liquid content of the undiluted washed fibrous suspension.

8. Apparatus for continuously washing fibrous suspensions having a varying consistency in aqueous suspending liquors containing dissolved impurities dissolving said impurities by exchanging aqueous suspending liquid for the aqueous suspending liquor containing impurities while controlling the dilution of the washed fibrous suspension that is obtained,



which comprises in a continuous flow washing system having at least one washing stage means for washing fibrous material of the suspension with aqueous suspending liquid substantially free from dissolved impurities; and forming a washed fibrous suspension in said aqueous suspending liquid substantially free from dissolved impurities; means for separating from the washed fibrous suspension and withdrawing and recirculating back to a washing stage aqueous suspending washing liquid containing dissolved impurities washed out from the fibrous suspension; means for diluting the washed fibrous suspension from the washing stage by adding aqueous suspending liquid substantially free from dissolved impurities to the washed fibrous suspension; means for measuring the volume amount of diluting aqueous suspending liquid added; means for measuring the volume amount of diluted washed fibrous suspension; and means for calculating continuously using these measured values to adjust the volume amount of washing liquid added according to the consistency of the washed fibrous suspension, to maintain substantially constant any difference between the amount of washing liquid added and the liquid content of the undiluted washed fibrous suspension.

4,273,613

NUCLEAR REACTOR AND METHOD OF OPERATING SAME

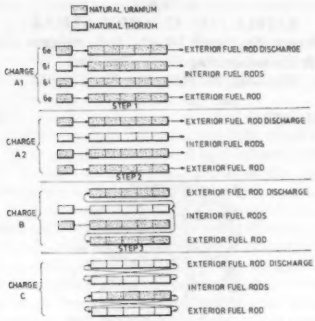
Alvin Radkowsky, Ramat Gan, Israel, assignor to Ramot University Authority for Applied Research, Tel Aviv, Israel

Filed Sep. 26, 1978, Ser. No. 945,897
Claims priority, application Israel, Oct. 13, 1977, 53122
Int. Cl.³ G21C *19/20*
U.S. Cl. 176—30 **25 Claims**

1. A method of operating a heavy-water-moderated nuclear reactor having an active core comprising a pressure tube including a cluster of fuel rods of natural-uranium-containing rod segments, some of which rods occupy exterior positions in the cluster and the remainder of which rods occupy interior positions in the cluster, said method comprising the Phases:

A. providing interior rod positions at one end of the cluster

with thorium-containing rod segments to irradiate the thorium until its multiplication factor is built up to about that of natural uranium; and



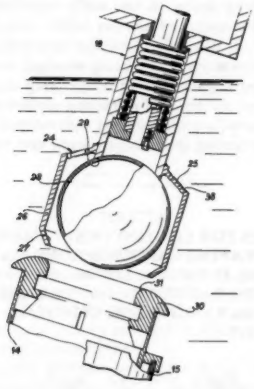
B. utilizing said thorium-containing rod segments irradiated in the interior rod positions of the cluster to refuel exterior rod positions at the charge end of the cluster.

4,273,614

CLOSURE DEVICE FOR FUEL ASSEMBLY POT

Pierre Pomie, Aix en Provence, and Charley Renaux, Jouques, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Nov. 13, 1978, Ser. No. 959,732
Claims priority, application France, Nov. 29, 1977, 77 35844
Int. Cl.[3] G21C *19/20*
U.S. Cl. 176—30 **11 Claims**



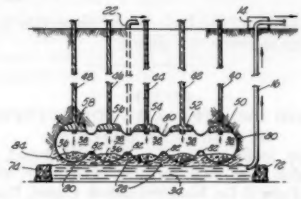
1. A handling device for a fast neutron reactor cooled by a liquid metal such as sodium and of the type comprising a container with a vertical axis containing the core and a given volume of sodium contained in said container, defining above the core a free level surmounted by an inert gas cushion, a thick horizontal slab placed above the gas cushion and constituting the upper closure of a protective caisson surrounding the container, an inclined ramp which passes into the container up to a loading and unloading station located in the vicinity of the core and extending at its opposite end into a handling chamber supported by the slab, a second inclined ramp connecting the inside of the handling chamber to a second loading and unloading station positioned externally of the caisson in a storage container, a carriage carrying a handling pot able to move along the said ramps and moving the pot from a position where it is submerged below the sodium level to a position where it is introduced into the inert gas atmosphere above the sodium level, said pot being open at its upper end so as to permit the introduction or removal of the assembly to be handled when it is positioned vertically on its carriage with respect to said loading and unloading stations provided for this purpose in the reactor vessel and in the storage container, wherein during its displacement between said stations the carriage is associated, to the right of the upper open end of the pot, with a generally cylindrical enclosure which is open towards the bottom and provided with an upper part and in which is mounted a hollow member, whereof at least the lower part has a spherical shape, whereby the hollow member bears via the spherical lower part against the upper open end of the pot when the latter emerges above said level.

4,273,615

OIL STIMULATION PROCESS

Farrokh Hirbod, 6424 Via Colinita, Rancho Palos Verdes, Calif. 90274

Filed Jul. 17, 1978, Ser. No. 925,576
Int. Cl.[3] E21B *43/263*
U.S. Cl. 176—39 **10 Claims**



1. A method of converting organic matter having a multiplicity of organic molecular structures to petroleum products by exploding an explosive device which forms an earth cavity comprising the steps of:

combining the organic matter with water to form an organic slurry;

pumping the organic slurry into a first earth strata having an ambient temperature less than about 150° F.;

allowing anaerobic digestion of the slurry in the first earth strata to occur;

providing at least one explosive device in a region above the first earth strata the distance between the explosive device and the first earth strata and the yield of the explosive device being selected so that the cavity formed upon ignition fo the explosive device does not penetrate the first earth strata; and

igniting the explosive device for providing heat and pressure indirectly against the organic slurry after anaerobic digestion occurs for facilitating chemical and molecular alteration of the organic molecular structures of the organic slurry for producing petroleum compounds from the organic slurry.

4,273,616

HIGH BURNUP NUCLEAR FUEL ROD

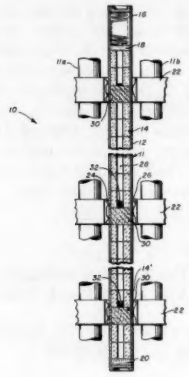
Mena G. Andrews, Newington, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Mar. 23, 1979, Ser. No. 23,438
Int. Cl.[3] G21C *3/02*
U.S. Cl. 176—68 **5 Claims**

1. In a nuclear fuel rod having a column of vertically aligned, hollow fuel pellets contained within an encapsulating cladding such that a central passage is formed along the length of the column, the improvement comprising:

a spacer plug having a solid cross section at least as large as the passage, the plug being interposed between proximate

fuel pellets at selected locations along the column, whereby any fuel pellet debris falling through the passage



is trapped by the next lower spacer rather than accumulating at the bottom of the column.

4,273,617

METHOD AND APPARATUS FOR QUENCHING HEATED BULK MATERIAL

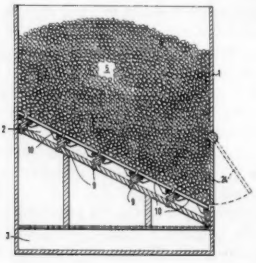
Franz Goedde, Stolberg; Wolfgang Schrank, Alsdorf, and Fritz Schulte, Meerbusch, all of Fed. Rep. of Germany, assignors to Hartung, Kuhn & Co. Maschinenfabrik GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Jul. 15, 1980, Ser. No. 169,039

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1979, 2929390

Int. Cl.³ C10B *39/04, 39/14*

U.S. Cl. 201—39 **7 Claims**



1. A method for quenching heated bulk material, especially coke, in a quenching chamber closed off from the atmosphere during the quenching, comprising the following steps: flowing a predetermined quantity of quenching liquid from the top downwardly through the bulk material so that the resulting steam also flows downwardly in parallel to the quenching liquid flow until the steam attains a certain temperature, said quantity of quenching liquid being such that it evaporates substantially completely except for a certain residual moisture in the coke, providing a carry-off resistance for the quenching steam which is inversely proportional to the respective bulk height above a bulk retaining, perforated grating, compensating the flow resistance of the quenching medium through the bulk material in such a manner that the flow resistance per unit area is substantially constant over the entire surface area of said grating, and distributing said quenching liquid quantity over the surface area of the bulk material such that the distributed quenching liquid is proportional to the bulk material height above said grating.

4,273,618

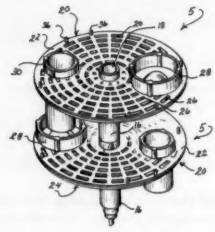
BAFFLE FOR ALCOHOL STILLS

Robert E. Strang, Sr., North Liberty, Ind., assignor to Injection Plastics & Manufacturing Co., LaPaz, Ind.

Filed Jul. 28, 1980, Ser. No. 172,752

Int. Cl.³ B01D *3/02*

U.S. Cl. 202—158 **6 Claims**



1. A baffle for an alcohol still, said baffle comprising a body having an upper cooking surface and lower refracting surface and a plurality of concentric series of spaced openings therethrough, a collection cup extending upwardly from said cooking surface, an open-ended downcomer tube carried by said body and projecting above said cooking surface and below said refracting surface, spacer means carried by said baffle and including an upwardly projecting socket and a downwardly projecting portion axially aligned with said socket, said downwardly projecting spacer of one baffle interfitting with and supported by the socket of another baffle, said spacer means being substantially centrally located on said body, said collection cup and downcomer tube being arranged in complementary relation for alignment with cooperating complementary parts of adjacent baffles, said refracting surface having a plurality of substantially radial ribs and a plurality of spaced concentric ribs projecting downwardly from said refracting surface.

4,273,619

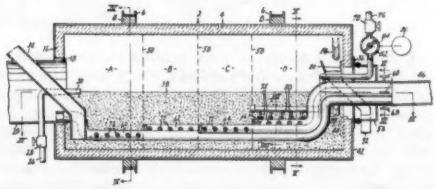
APPARATUS FOR CONTINUOUSLY CARBONIZING AND ACTIVATING CARBONACEOUS MATERIALS

James F. Angelo, II, P.O. Box 212, Jonesboro, Ark. 72401

Filed Nov. 19, 1979, Ser. No. 95,366

Int. Cl.³ C10B *1/10;* **C01B** *31/08*

U.S. Cl. 202—211 **2 Claims**



1. An apparatus for carbonizing a carbonaceous raw material to reduce it to a char, and for activating said char to produce activated carbon, comprising:

a. an elongated cylindrical retort having its axis inclined slightly from horizontal,

b. means operable to rotate said retort slowly about its axis,

c. means operable to introduce said raw material in particulate form into the higher end of said retort, whereby it is

advanced through said retort in the form of a tumbling bed by the rotation of said retort,

d. means operable to remove the material from the lower end of the retort,

e. means operable to induce a continuous draft in said retort toward the higher end thereof,

f. means operable to inject air into the higher end zone of said retort, and to so regulate the air so injected that the carbonization reaction is completed within said higher retort end zone, and

g. means operable to inject an oxdizing but non-combustible gas, but not air, into the lower end zone of said retort, said oxidizing gas being preheated to a temperature at least as high as that at which the material of the tumbling bed enters said lower end zone of the retort, said oxidizing gas injection means including nozzles spaced from the interior cylindrical wall of said retort and disposed above and in close proximity to said tumbling bed of material and operable to deliver forcible jets of oxidizing gas downwardly and directly into said tumbling bed of material only within said lower retort end zone, whereby to stir and agitate said material to provide improved permeation thereof by said gas.

4,273,620

PROCESS FOR RECONCENTRATING MOIST GLYCOL

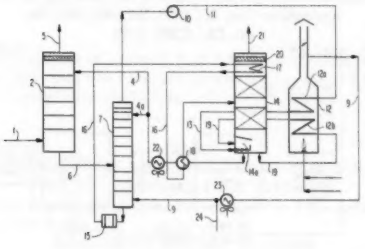
Walter Knobel, Kerpen, Fed. Rep. of Germany, assignor to Davy International AG, Frankfurt, Fed. Rep. of Germany

Filed Jun. 26, 1978, Ser. No. 919,234

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1977, 2728745

Int. Cl.³ B01D *3/00, 53/26;* **C07C** *29/26*

U.S. Cl. 203—18 **8 Claims**



1. In a process for reconcentrating glycol which has been used to remove moisture from moist natural gas, whereby said natural gas is treated with glycol to absorb moisture from said natural gas and whereby the resulting moisture-containing glycol is reconcentrated by removal of moisture therefrom, the improvement which comprises:

(a) heating said moisture-containing glycol to a temperature of from about 100° to 210° C. by heat exchange with flue gas from a reboiler; and thereafter

(b) drying the flue gas from the reboiler by contact with glycol,

(c) stripping additional moisture from said moisture-containing glycol with dried flue gas from said reboiler.

4,273,621

PROCESS FOR DEHYDRATING ETHANOL AND FOR THE PRODUCTION OF GASOHOL THEREFROM

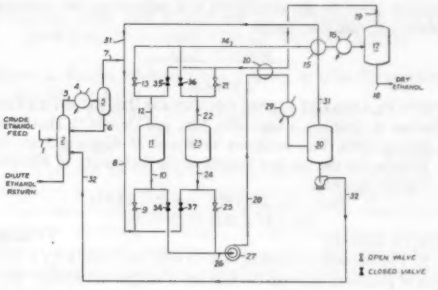
Louis L. Fornoff, Cedar Grove, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Filed May 5, 1980, Ser. No. 146,550

Int. Cl.³ B01D *3/00, 53/04*

U.S. Cl. 203—19 **23 Claims**

23. A process for the production of an ethanol-gasoline fuel for internal combustion engines, comprisng distilling, at a pressure of at least about 50 p.s.i.a., a crude fermentation aqueous ethanol product to produce a gaseous ethanol-H_2O admixture containing about 78 mole % ethanol; diluting said admixture with an amount of gaseous CO_2; drying said diluted gaseous admixture with a type **3A** crystalline zeolite; said pressure and said amount being sufficient to permit condensation of a



dried ethanolic product at ambient temperatures; condensing the dried ethanolic product at an ambient temperature; recovering the anhydrous ethanol product; and mixing said anhydrous ethanol with sufficient gasoline so as to produce an ethanol-gasoline blend suitable for use as said fuel.

4,273,622

METHOD OF TREATING ALPHA-METHYLBENZYLALCOHOL DEHYDRATION PRODUCTS

Mitchell Becker, Teaneck, N.J., assignor to Halcon Research & Development Corp., New York, N.Y.

Continuation of Ser. No. 918,124, Jun. 22, 1978, abandoned, which is a continuation-in-part of Ser. No. 870,543, Jan. 16, 1978, abandoned. This application Nov. 26, 1979, Ser. No. 97,452

Int. Cl.³ B01D *3/10;* **C07C** *7/04, 15/46*

U.S. Cl. 203—28 **10 Claims**

1. A process for the recovery of monomeric values from the polymeric components of a first polymer-containing residue obtained in the preparation of styrene from alpha-methylbenzyl alcohol by dehydration of alpha-methylbenzyl alcohol to styrene which comprises distilling said residue in a first step to produce monomeric values from at least some of said residue and to remove at least some of said monomeric values as distillate and to leave a second polymer-containing residual material and thereafter distilling the second residual material remaining from the first stage in a second stage at a temperature higher than the temperature prevailing in the first stage and for a longer period of time to produce additional monomeric values from said polymer-containing residual material while removing said additional monomeric values as distillate, at least a part of said monomeric values being produced by the conversion of the polymeric components to monomeric values.

4,273,623

PROCESS FOR RECOVERY OF RESORCIN

Isao Hashimoto, Iwakuni; Toru Taguchi, Ichihara, and Hirohiko Nambu, Iwakuni, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed May 22, 1979, Ser. No. 41,342

Claims priority, application Japan, May 30, 1978, 53/63781

Int. Cl.³ B01D *3/34*

U.S. Cl. 203—92 **5 Claims**

1. In the process for the preparation of resorcin, by the steps of acid-decomposing m-diisopropylbenzene dihydroperoxide in an inert solvent in the presence of an acid catalyst, separating the catalyst from the acid-decomposition reaction mixture and subjecting the reaction mixture to distillation to separate a resorcin-containing concentrate from acetone formed as a

by-product and the inert solvent, the improvement comprising carrying out the acid-decomposition of the dihydroperoxide in the presence of an acidic solid catalyst in an amount of 50 to 200% by weight based on the dihydroperoxide, adding water to the acid decomposition reaction mixture in an amount of 20 to 70% by weight based on resorcin contained in the reaction mixture prior to the distillation and subjecting the resulting mixture to said distillation.

4,273,624

THIN PLATINUM FILMS ON TIN OXIDE SUBSTRATES

Herbert A. Laitinen, Gainesville, Fla., and Donald C. Thornton, Philadelphia, Pa., assignors to Board of Regents, State of Florida, for the use and benefit of the University of Florida, Gainesville, Fla.

Filed Mar. 28, 1979, Ser. No. 24,531
Int. Cl.[2] C25D *5/18, 3/50*
U.S. Cl. 204—23 **7 Claims**

1. The process of coating a tin oxide substrate with a thin film of platinum wherein the film has a weight not greater than about 1 microgram per square centimeter of coated substrate surface, which comprises the steps of exposing an uncoated tin oxide substrate to a platinum-containing electrolyte and applying a current density of less than 1 milliampere per square centimeter to the surface of the tin oxide substrate.

4,273,625

METHOD OF TREATING OBJECTS THE SURFACE OF WHICH CONSISTS OF TIN

Renaat E. Van de Leest; Gerrit Krijl, and Ewoud A. Boonzajer Flaes, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 14, 1980, Ser. No. 178,045
Claims priority, application Netherlands, Aug. 28, 1979, 7906441
Int. Cl.[3] C25D *11/00*
U.S. Cl. 204—56 R **3 Claims**

1. A method of treating objects of which at least the surface consists of tin, the objects being alternately subjected to a cathodic and to an anodic potential in an electrolyte solution, characterized in that the objects are subjected to an electrolytic treatment in an aqueous solution of a tungstate in a concentration of at least 0.02 M, and having a pH from 4 to 11, a periodically reversed current being applied whose frequency is at least 0.2 Hz but not more than 2 Hz, the current density in an absolute value of the maximum current density being at least 0.2 A/dm^2 but not more than 1 A/dm^2, the ratio of the anodic current density to the cathodic current density being at least 0.5 and not more than 1 and the ratio of the anodic to the cathodic pulse durations being not more than 2 and not less than 0.02 during a time sufficient to produce a layer having a thickness between 0.03 and 0.2 μm.

4,273,626

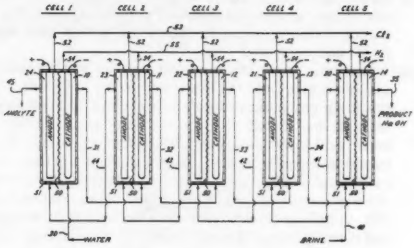
ELECTROLYTE SERIES FLOW IN ELECTROLYTIC CHLOR-ALKALI CELLS

Bobby R. Ezzell, and Marius W. Sorenson, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 924,268, Jul. 13, 1978, Pat. No. 4,197,179. This application Oct. 1, 1979, Ser. No. 80,814
Int. Cl.[3] C25B *1/34, 1/02*
U.S. Cl. 204—98 **13 Claims**

10. In the process of producing hydrogen, aqueous alkali metal hydroxide and chlorine gas by the electrolysis of aqueous alkali metal chloride solution in a bank of a plurality of membrane cells, said hydrogen and alkali metal hydroxide being produced at cathodes in catholyte portions, said chlorine being produced at anodes in anolyte portions, said membrane providing a substantially hydraulically-impermeable divider between catholyte portions and anolyte portions, the improvement which comprises:

flowing an aqueous alkali metal chloride as anolyte for the anolyte portions, said flowing being done in sequence from



anolyte portion to anolyte portion, removing spent anolyte from the last anolyte portion of the sequence, and

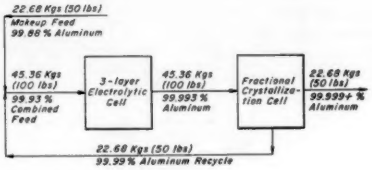
flowing an aqueous catholyte from catholyte portion to catholyte portion in sequence and in countercurrent manner to the anolyte flow, removing caustic-enriched catholyte from the last catholyte portion of the sequence.

4,273,627

PRODUCTION OF EXTREME PURITY ALUMINUM

Robert K. Dawless, Monroeville, and Stanley C. Jacobs, Lower Burrell, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 973,141, Dec. 26, 1979. This application Dec. 26, 1979, Ser. No. 107,138
Int. Cl.[3] C25C *3/06*
U.S. Cl. 204—67 **3 Claims**



1. An improved process for purifying aluminum containing impurities comprising:

(a) introducing said aluminum to the anode layer of an electrolytic cell of the type having a bottom layer of molten aluminum constituting said anode layer and having a top layer of molten aluminum constituting a cathode layer, said anode layer separated from said cathode layer by an electrolyte layer;

(b) electrolytically transporting aluminum from said anode layer through said electrolyte layer to said cathode layer while leaving said impurities in said anode thereby partially purifying said aluminum;

(c) thereafter, removing a portion of said partially purified molten aluminum from said cathode layer;

(d) treating said portion of partially purified molten aluminum with a carbonaceous material to substantially lower the amount of magnesium contained therein;

(e) fractionally crystallizing said molten aluminum portion in a crystallization cell to remove eutectic impurities therefrom by solidifying a fraction of said molten aluminum, said solid fraction having a higher purity than that constituting the remaining molten aluminum fraction, thereby concentrating said eutectic impurities in said molten fraction; and

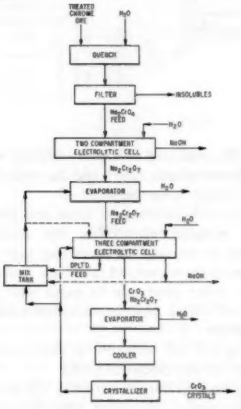
(f) separating said molten fraction from said solid fraction to provide said purified aluminum.

4,273,628

PRODUCTION OF CHROMIC ACID USING TWO-COMPARTMENT AND THREE-COMPARTMENT CELLS

William E. Kidon, Chardon; Nicholas Shuster, Perry, and Andrew D. Babinsky, Chagrin Falls, all of Ohio, assignors to Diamond Shamrock Corp., Dallas, Tex.

Filed May 29, 1979, Ser. No. 43,377
Int. Cl.³ C25B *1/14, 1/22*
U.S. Cl. 204—87 **37 Claims**



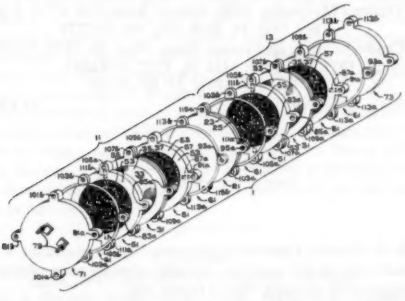
6. The process of claims 3, 4, or 5 wherein solution is withdrawn from said mix tank and introduced in step (F) to said three-compartment electrolytic cell.

4,273,629

SOLID POLYMER ELECTROLYTE CHLOR-ALKALI PROCESS AND ELECTROLYTIC CELL

Malcolm Korach, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 23, 1979, Ser. No. 14,468
Int. Cl.³ C25B *1/34, 1/46, 9/00, 11/04*
U.S. Cl. 204—98 **9 Claims**



6. In an electrolytic cell having a solid polymer electrolyte with an anodic electrocatalyst on an anodic, first surface thereof and a cathodic electrocatalyst on an opposite, cathodic second surface means thereof, for feeding oxidant to the cathodic, second surface of the solid polymer electrolyte, and an HO_2^- disproportionation catalyst in contact with the cathodic, second surface of the solid polymer electrolyte, the improvement wherein the HO_2^- disproportionation catalyst comprises a porous electroconductive carbon substrate having a porous, hydrophobic, fluorocarbon surface thereof.

4,273,630

PROCESS FOR THE START-UP OF MEMBRANE CELLS FOR THE ELECTROLYSIS OF AQUEOUS SALT SOLUTIONS

Steven J. Specht, Mentor, Ohio, assignor to Olin Corporation, New Haven, Conn.

Filed Jan. 23, 1980, Ser. No. 114,481
Int. Cl.³ C25B *15/00, 15/02, 15/08, 1/34*
U.S. Cl. 204—98 **11 Claims**

1. A process for the start-up of membrane cells for the electrolysis of an aqueous salt solution, said cells having an anode compartment containing a plurality of anodes, a cathode compartment containing a plurality of cathodes, and an ion exchange membrane separating said anode compartment from said cathode compartment, said process which comprises the steps of:

(a) feeding simultaneously said aqueous salt solution to said anode compartment and a liquid to said cathode compartment while maintaining substantially equal pressure on said membrane from each of said compartments,

(b) applying pressure to said membrane from said anode compartment,

(c) applying pressure to said membrane from said cathode compartment, and

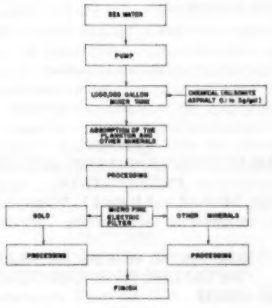
(d) cyclically repeating steps b and c during the start-up period.

4,273,631

PROCESS FOR THE CONTINUOUS RECOVERY OF GOLD AND OTHER METALS FROM SEA WATER

Vincent W. Layton, 1306 SW. 6th St., Miami, Fla. 33135, and Ernest Mueller, 39 Painter Hill Rd., Woodbury, Conn. 06798

Filed Jun. 13, 1979, Ser. No. 48,205
Int. Cl.³ C25C *1/20*
U.S. Cl. 204—109 **9 Claims**



1. A process for recovering gold and trace elements from plankton in plankton-containing water, comprising treating said water with means to cause coagulation and precipitation of plankton containing gold cations and other cations into particles of filterable size, filtering the thus treated water to separate the precipitate from a filtrate, treating the said filtered precipitate so as to cause it to dissolve into a solution adaptable for use with electrolytic separation means and processing the said solution to separate gold and other trace elements from the solution by electrolytic separation means, wherein the means to cause coagulation and precipitation of said plankton is asphaltum that is added to the water.

4,273,632

AMINOPLAST-CONTAINING RADIATION CURING COATING COMPOSITIONS

Bizhan M. Zarnegar, Metuchen, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 679,412, Apr. 22, 1976, abandoned.
This application Apr. 18, 1979, Ser. No. 31,084
Int. Cl.[3] C08J 3/28; C08L 61/28
U.S. Cl. 204—159.15 14 Claims

1. A liquid radiation-curable coating composition comprising a mixture of polyethylenically unsaturated compound, liquid monoethylenically unsaturated hydroxy functional polyether, and from 1–25%, based on the total weight of ethylenically unsaturated material, of an aminoplast, whereby a thermal cure following the radiation cure yields a cured coating which exhibits an increased ability to withstand fabrication stresses without loss of adhesion to the substrate.

4,273,633

RADIATION CURABLE DISPERSIONS CONTAINING HIGH MOLECULAR WEIGHT ESSENTIALLY NONPOLYMERIZABLE VINYL RESINS

Charles H. Carder, Amma, and Joseph V. Koleske, Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jun. 11, 1979, Ser. No. 47,237
Int. Cl.[3] C08F 259/04
U.S. Cl. 204—159.17 8 Claims

1. A dispersion comprising essentially (A) from about 10 to about 50 weight percent of an essentially non-polymerizable, high molecular weight vinyl chloride resin having an inherent viscosity above about 0.7 measured at 30° C. using cyclohexanone as the solvent and a concentration of 0.2 gram of resin per deciliter of solution dispersed in (B) from about 50 to about 90 weight percent of a mixture of acrylyl compounds, said mixture of acrylyl compounds constituted of from about 35 to about 85 weight percent of monofunctional acrylyl compound and from about 15 to about 65 weight percent of polyfunctional acrylyl compound.

4,273,634

PRECURED SILICONE EMULSION AND METHOD FOR PREPARATION

John C. Saam, Midland, and Robert L. Wegener, Bay City, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Nov. 14, 1979, Ser. No. 94,268
Int. Cl.[3] C08L 83/06; C08F 77/40
U.S. Cl. 204—159.15 11 Claims

1. An aqueous silicone emulsion which provides an elastomeric product upon removal of the water under ambient conditions, comprising a continuous water phase and a dispersed phase of crosslinked silicone prepared by

(A) first forming a stabilized dispersion of hydroxyl endblocked polydiorganosiloxane in water, the polydiorganosiloxane containing sufficient vinyl-substituted siloxane units to facilitate the crosslinking of the polydiorganosiloxane and having a weight average molecular weight of at least 5,000, and then

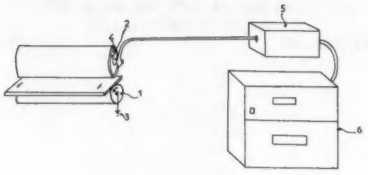
(B) treating the dispersion to provide a crosslinking action by forming radicals within the dispersed polydiorganosiloxane.

4,273,635

PROCESS AND APPARATUS FOR THE TREATMENT OF FIBROUS WEBS

Claudius Beraud, Tassin-la-Demi-Lune, and Jean Jacquemart, Chatenay-Malabry, both of France, assignors to Institut Textile de France, Boulogne-Sur-Seine, France

Filed May 29, 1979, Ser. No. 43,257
Claims priority, application France, May 30, 1979, 78 16817
Int. Cl.[3] C08F 2/52
U.S. Cl. 204—165 9 Claims



1. A process for treatment of a bulky fibrous web formed at least in part of thermoplastic fibers and the web having considerable thickness comprising the steps of:

(a) passing the web between at least one pair of rotating cylindrical metallic electrodes, the electrodes being spaced apart to provide an insulating gap therebetween and one electrode connected to a high frequency generator and the other electrode to earth and one electrode being covered with a layer of dielectric material having a smooth surface;

(b) compressing the web between the electrodes and the web being driven by the electrodes; and

(c) creating glow discharges between the electrodes from the high frequency generator and the discharge path extending only a part of the insulating gap separating the two electrodes, and the glow discharge starting from the electrode covered with dielectric material and extending to near the surface of the other electrode through substantially the thickness of the web whereby cohesion is imparted to the web which retains its bulk, thickness and textile characteristics existing before the web is subjected to the above steps.

4,273,636

SELECTIVE CHEMICAL SENSITIVE FIELD EFFECT TRANSISTOR TRANSDUCERS

Kiyoo Shimada; Makoto Yano, both of 1660, Sakazu, Kurashiki; Kyoichiro Shibatani, 1000-107, Hajima, Kurashiki, and Tsutomu Makimoto, 1660, Sakazu, Kurashiki, all of Japan

Filed May 19, 1978, Ser. No. 907,729
Claims priority, application Japan, May 26, 1977, 52-62445; May 26, 1977, 52-62446; May 26, 1977, 52-62447
Int. Cl.[3] G01N 27/30, 27/40
U.S. Cl. 204—195 P 12 Claims

5. A selective chemically sensitive FET transductor which selectively detects specific chemical substances to which the transducor is exposed, which comprises:

an FET transducer whose gate region is overlayed with a chemically selective sensitive membrane, which reacts or interacts with a specific chemical substance(s) and which is provided with a semipermeable membrane having a water content greater than 10%, overlying said chemically selective sensitive membrane, said semipermeable membrane being formed of a hydrophilic material selected

from the group consisting of a polymethacrylate, a polyacrylate, a polyacrylamide, a polyvinylpyrrolidone, a polyvinyl alcohol and copolymers thereof.

4,273,637

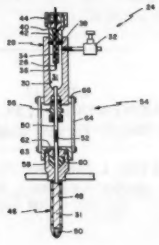
PRESSURE BALANCED EXTERNAL REFERENCE ELECTRODE ASSEMBLY AND METHOD

Digby D. MacDonald, Columbus, Ohio, and Arthur C. Scott, Cupertino, Calif., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 13,621, Feb. 21, 1979, abandoned. This application Jan. 23, 1980, Ser. No. 114,618

Int. Cl.³ G01N *27/30*

U.S. Cl. 204—195 F **16 Claims**



1. An external reference electrode assembly for use in measuring the potential between a working electrode in housing means providing a pressurized, high temperature environment containing a solution which supports electrolytic conduction and a reference electrode located outside said environment, said assembly comprising: a first rigid housing adapted to be positioned outside said environment and including a first inner chamber filled with an electrolytic solution; a reference electrode located in said electrolytic solution within said chamber and adapted for connection with a voltage measuring means along with said working electrode for measuring the potential between the two electrodes; a second housing including a flexible section adapted to be positioned in its entirety within said pressurized, high temperature environment and defining a second inner chamber filled with said electrolytic solution, said second housing including a liquid junction adapted to be interposed between said environment and said second chamber for providing an electrolytic conduction path between the solutions within said environment and said second chamber; a rigid tube connected with said first and second housing and defining a passageway in fluid communication with and extending between said chambers and filled with said electrolytic solution, said tube being of a material which establishes a temperature gradient between said chambers along said passageway; and pressure control means adapted to vary the combined volume of said first and second chambers and said passageway in response to changes in pressure in said environment in a way which maintains the pressure in said first chamber substantially equal to the pressure in said environment, said pressure control means including said flexible section, the latter being sufficiently flexible to vary the volume within said second chamber depending on the pressure in said environment to provide said equal pressures.

4,273,638

ELECTROCHEMICAL SENSING PROBE

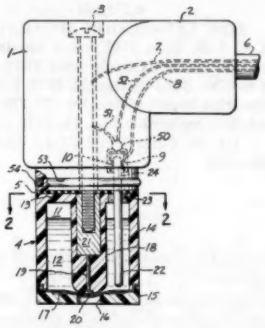
Dorian J. Swartz, Yorba Linda, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Continuation of Ser. No. 970,890, Dec. 19, 1978, abandoned. This application Apr. 21, 1980, Ser. No. 142,488

Int. Cl.³ G01N *27/54*

U.S. Cl. 204—195 P **23 Claims**

1. A sensing probe having a disposable electrolyte housing coupled to a reusable connector, which connector has a pair of electrical leads, wherein the improvement comprises: a sealed housing containing an electrolyte and two electrodes both of which are in contact with the same electrolyte; said housing including a one-piece molded thermoplastic body member that includes an outer peripheral wall, integral top wall, and an integral post depending from this top wall; said integral post having an integral closed bottom wall through which extends an electrical conductor; said post having a cavity extending downwardly from the body member's top wall; a threaded socket secured in the post's cavity; a membrane supporting cap sealing off a bottom opening of the housing, whereby the housing can be turned upside down and filled through its bottom opening prior to assembling the bottom cap, and no electrolyte can leak into the post cavity because of the integral end wall of the post; two noncoaxial conductors which extend through a wall of the sealed housing and connect to the electrodes; and noncoaxial make and break electrical contact joints



between each conductor and its corresponding electrical lead on the connector, whereby the contact joints prevent rotational movement of the disposable housing relative to the reusable connector.

17. A sensing probe having a disposable electrolyte housing coupled to a reusable connector, which connector has a pair of electrical leads, wherein the improvement comprises: a sealed housing containing an electrolyte and two electrodes both of which are in contact with the same electrolyte; two noncoaxial conductors which extend through a wall of the sealed housing and connect to the electrodes; noncoaxial make and break electrical contact joints between each conductor and its corresponding electrical lead on the connector, whereby the contact joints prevent rotational movement of the disposable housing relative to the reusable connector; and a spacer located between the connector and housing with the connector and housing each having protruding stubs, and the spacer includes coupled conductive sockets for receiving the protruding stubs.

4,273,639

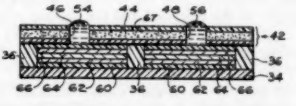
CAPILLARY BRIDGE IN APPARATUS FOR DETERMINING IONIC ACTIVITY

William F. Gottermeier, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 20, 1979, Ser. No. 50,845

Int. Cl.³ G01N *27/46, 27/58*

U.S. Cl. 204—195 R **10 Claims**



1. In a device having an electrically insulative frame and a

pair of solid electrodes mounted on a surface of the frame in a spaced-apart relationship for generating therein an electrical potential having a predetermined relationship to the amount of ionic analyte activity present in a contacting sample of an aqueous solution; the improvement comprising:

an integral cover sheet extending over both electrodes and substantially the full surface of the frame upon which the electrodes are mounted, said cover sheet being formed of a nonporous material and being bonded to the frame to secure the electrodes therebetween;

a fluid access hole aligned with each electrode, extending through said cover sheet for receiving a sample of the solution in contact with the electrodes; and

an elongated ribbon of porous material encapsulated in said cover sheet and extending at least between said fluid access holes for providing ionic flow between solution samples in each fluid access hole.

4,273,640

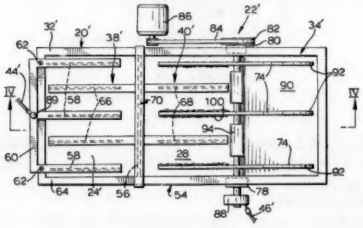
ZINC EXTRACTION APPARATUS

Richard H. C. LeB. Ross, 1701 Avoca Apartments, 10 Avoca Ave., Toronto, Ontario, Canada (M4T 2B7)

Division of Ser. No. 863,190, Dec. 22, 1977, Pat. No. 4,183,794, and a continuation-in-part of Ser. No. 777,270, Mar. 14, 1977, abandoned. This application Nov. 21, 1979, Ser. No. 96,354

Int. Cl.³ C25D *17/02, 21/12, 17/12*

U.S. Cl. 204—216 **5 Claims**



1. Apparatus for use in extracting primary zinc metal from an acid zinc sulfate solution derived from an ore concentrate, the apparatus comprising:

first and second electrolytic cells, the first cell being intended to receive the acid zinc sulfate solution and having an anode which is insoluble in the solution, and the second cell being intended to receive an alkaline electrolyte and having a cathode which is insoluble in said electrolyte;

said first and second electrolytic cells being defined by a common tank having an internal wall dividing said tank into first and second compartments, said first compartment being intended to receive said acid zinc sulfate solution, and said second compartment being intended to receive said alkaline electrolyte;

said acid cell having a plurality of anodes disposed in spaced positions transversely of the cell; and said alkaline cell having a corresponding plurality of cathodes disposed in spaced positions transversely of the cell corresponding generally to the positions of the anodes in the acid cell;

a plurality of common electrodes which are insoluble both in the acid zinc sulfate solution and in the alkaline electrolyte and which comprise first and second common electrodes electrically coupled together and arranged so that the first common electrodes can be disposed generally between said anodes of the acid cell and the second common electrodes can be disposed generally between said cathode of the alkaline cell, and said common electrodes can be transferred between the cells;

whereby in use, said acid zinc sulfate solution can be subjected to electrolysis in said first cell with said first common electrodes acting as cathodes, thereby causing primary zinc metal to be deposited as a coating on the electrodes, and the coated electrodes can be subsequently transferred from said first cell to said second cell in which said alkaline electrolyte can be subjected to electrolysis so that said primary zinc metal is transferred from the first common electrodes to the cathodes of the second cell in sponge-like form, from which it may be mechanically removed, and whereby said electrolysis of the zinc sulfate solution and of said alkaline electrolyte may be performed simultaneously in the respective cells so that zinc metal is deposited on electrodes in the acid cell, while previously deposited zinc is stripped from electrodes in the alkaline cell, the electrodes being transferable between the cells to permit previously coated electrodes from said acid cell to be stripped in said alkaline cell while the previously stripped electrodes from said alkaline cell are redeposited with the zinc in the acid cell.

4,273,641

IMPROVEMENTS IN ELECTROLYZERS

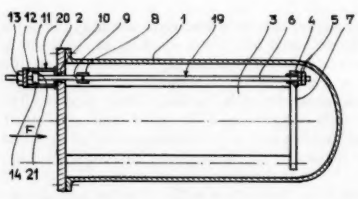
Gerard Pere, Le Breuil, France, assignor to Creusot-Loire, Paris, France

Filed Feb. 1, 1980, Ser. No. 117,652

Claims priority, application France, Jul. 2, 1979, 79 03796

Int. Cl.³ C25B *9/00*

U.S. Cl. 204—253 **2 Claims**



1. In an electrolyzer of the type consisting of a stack of elemental electrolytic cells, said stack being held between two end plates connected by tie rods, the improvement wherein each of said tie rods includes a device for variable tightening which is remote-controlled and equipped with a device for measurement of said tightening, and in that the whole of the said devices are connected to a common force and position control cabinet.

4,273,642

ELECTROLYTIC CELL

Matti Seilo, Harjavalta, Finland, assignor to Outokumpu Oy, Helsinki, Finland

Filed Oct. 17, 1979, Ser. No. 85,632

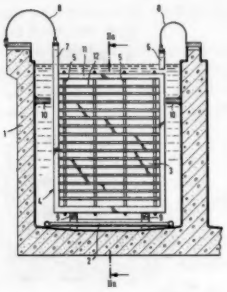
Claims priority, application Finland, Oct. 17, 1978, 783156

Int. Cl.³ C25B *9/00, 9/02*

U.S. Cl. 204—286 **2 Claims**

1. An electrolytic cell, comprising: a container for electrolyte having a bottom and side walls; a plurality of vertical platelike electrodes in spaced mutually parallel relationship, said electrodes being supported at a distance from each other on the bottom of the container; a lug attached to the upper part of each electrode such that the position thereof is offset in relation to the lugs of each adjacent electrode; an external source of current having two poles; and means for connecting each second electrode to one pole and the electrode therebetween to the other pole; each second electrode connected to said one pole comprising an electrically conducting frame with said lug attached thereto; attached to said frame a plurality of spaced, separated and substantially parallel electrically con-

ducting wires extending from one side of the frame to the opposite side; and attached to said frame vertically extending



means of an electrically insulating material on both sides of said electrode for separating the electrodes from each other.

4,273,643

PROCESS FOR PRODUCTION OF SYNTHETIC CRUDE OIL, ALCOHOLS, AND CHARS DURING LOW TEMPERATURE CARBONIZATION OF COALS

Harold L. Bennett, Upper Marlboro, Md., assignor to Bennett Engineering Inc., Camp Springs, Md.

Filed Oct. 1, 1979, Ser. No. 80,293
Int. Cl.³ C10G *1/00, 1/06;* **C10B** *57/00;* **B09B** *3/00*
U.S. Cl. 208—8 R **12 Claims**

1. In a process for preparing an essentially sulfur free synthetic crude oil including the steps of roasting carbonaceous materials at a temperature of about 400° to 600° C. for about two to four hours, continuously collecting and condensing the distillation gases, separating the low temperature tars from the condensed gaseous products contacting the low temperature tars with a first hydrogen carrying catalyst in a fixed bed system heated to a temperature of 300° to 700° C. and a pressure of 500 to 2000 psi in the presence of hydrogen added in an amount of 1200 to 1500 cubic feet of hydrogen per barrel of low temperature tars, cooling the effluent from the reactor and separating the gaseous products therefrom, and recovering the essentially sulfur free synthetic crude oil product, the improvement comprising the derivation of a char comprising the steps of heating said carbonaceous materials up to 600° C., blending into said carbonaceous materials with continuous agitation additional carbonaceous materials selected from the group consisting of carbonaceous industrial waste, municipal waste, sewerage solids, and peat to reduce agglomeration and increase the quantity and quality of the low temperature tars, chars and gases derived during the char production, and treating the char with a gas selected from the group consisting of live steam, super heated steam and H_2 for at least two minutes and up to 120 minutes to remove a substantial amount of sulfur from the hot char.

4,273,644

PROCESS FOR SEPARATING BITUMINOUS MATERIALS

Samuel W. Harris, and Jack W. Roach, both of Oklahoma City, Okla., assignors to Kerr-McGee Refining Corporation, Oklahoma City, Okla.

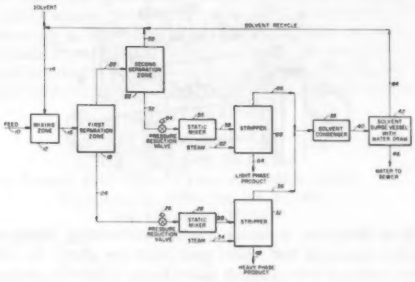
Filed Jun. 30, 1980, Ser. No. 164,607
Int. Cl.³ B65D *85/46*
U.S. Cl. 208—321 **11 Claims**

1. A process comprising:

separating an admixture comprising a fluid-like bituminous material and a solvent in a separation zone into at least a fluid-like light phase comprising a portion of said bituminous material and solvent and a fluid-like heavy phase comprising the remainder of said bituminous material and solvent by maintaining the admixture at an elevated temperature and pressure;

reducing the pressure on said heavy phase to vaporize at least a portion of the solvent present therein and form a mixture of fluid-like bituminous material in association with said vaporized solvent together with undesired fine particles of bituminous material dispersed therein;

introducing said mixture into a static mixer to cause said fine particles of bituminous material to coalesce by turbulent contacting with said fluid-like bituminous material in said mixture to form a coalesced mixture of fluid-like bituminous material in association with said vaporized solvent, said vaporized solvent of said coalesced mixture being



substantially free of any fine particles of bituminous material;

introducing said coalesced mixture of fluid-like bituminous material in association with vaporized solvent into a steam stripper;

introducing steam into said steam stripper to contact said coalesced mixture to separate at least a portion of any nonvaporized solvent remaining therein and to form at least one stream comprising the fluid-like bituminous material and one other stream comprising vaporized solvent and steam; and

recovering said vaporized solvent and steam from said steam stripper substantially free of any fine particle size bituminous material.

4,273,645

SOLVENT EXTRACTION PRODUCTION OF LUBE OIL FRACTIONS

Costandi A. Audeh; Israel J. Heilweil; James R. White, all of Princeton, N.J., and Tsoung Y. Yan, Philadelphia, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

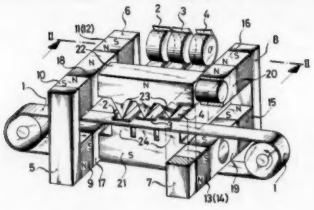
Filed May 11, 1979, Ser. No. 37,967
Int. Cl.³ C10G *21/02*
U.S. Cl. 208—323 **3 Claims**

1. In an improved method for producing lubricating oils by a liquid-liquid solvent extraction process which comprises contacting a lube oil-containing hydrocarbon charge under conditions of solvent selectivity to permit the recovery of a raffinate phase which upon dewaxing will provide a lube oil product, the improvement whereby there is present in the extraction system from about 0.002% to about 0.2% by weight of the solvent a water soluble polyethylene oxide resin to facilitate phase separation and to increase raffinate yield, the solvent being selected from the group consisting of furfural, phenol, cresylic acid and sulfur dioxide.

4,273,646
MAGNETIC SEPARATOR HAVING INTERSECTING CONVEYOR BELTS

Heinrich Spodig, Netteberge 202, D-4714 Selm/Westf, Fed. Rep. of Germany

PCT No. PCT/DE78/00010, § 371 Date Apr. 4, 1979, § 102(e) Date Mar. 19, 1979, PCT Pub. No. WO79/00085, PCT Pub. Date Feb. 22, 1979.
This PCT application filed Mar. 19, 1979, Ser. No. 24,651
Claims priority, application Fed. Rep. of Germany, Aug. 4, 1977, 2735150
Int. Cl.³ B03C 1/22
U.S. Cl. 209—223 R 6 Claims



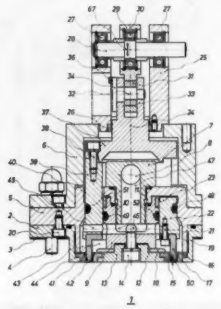
1. A magnetic separator having intersecting, elongated, endless conveyor belt means positioned one above the other with each said conveyor belt means being defined by an upper and lower run, the lower belts means serving to transport the material to be separated and the upper belt means serving as discharge means for the separated material as well as first and second soft-iron pieces forming the working gap and being magnetized in opposite directions by a magnetic system with the first pole piece being arranged below the upper run of the lower belt means and the second pole piece being arranged above the lower run of the upper belt means, the first pole piece having a pole surface of large area and the second pole piece having at least one smaller pole surface for concentrating the magnetic flux and extending in the longitudinal direction of the upper belt means, said magnetic system comprising two frames that are spaced apart in the direction of the lower belt means with each of said frames surrounding the upper run of the lower belt means, one of said frames being arranged along each of the longitudinal sides of the upper belt means, said frames comprising two symmetrical halves of alternatingly successive permanent magnets and soft-iron parts, said frames being connected by said two first mentioned soft-iron pole pieces.

4,273,647
APPARATUS FOR AND A METHOD OF SEPARATING GRINDING BODIES AND GROUND MATERIAL IN AN AGITATOR MILL

Willy John, Selb, Fed. Rep. of Germany, assignor to Gebruder Neizsch Maschinenfabrik GmbH & Co., Fed. Rep. of Germany

Filed Aug. 22, 1979, Ser. No. 68,799
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1979, 2836969
Int. Cl.³ B07B 7/06
U.S. Cl. 209—250 20 Claims

1. A separator for separating grinding bodies and ground material in an agitator mill, comprising separator members which border on a grinding chamber and define at least one gap between them of a nominal width smaller than the nominal size of the grinding bodies in the grinding chamber, at least one separator member being arranged to be stationary and at least one separator member being designed to be movable and connected with a drive means adapted to impart oscillating motions to the movable separator member in the direction of flow and contrary to the direction of flow of the ground material passing through the gap, comprising at least one of the separator members (15, 16, 17; 55, 59; 74, 75; 80) being so tapered at

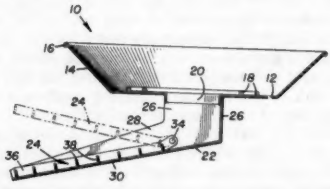


its side facing the gap (41, 42; 62; 76) that the gap narrows from its nominal width (70) to a minimum value (73) whenever the movable separator member (17; 59; 74; 80) moves against the flow of the ground material.

4,273,648
QUICK MINER'S PAN

Robert E. Legg, 39463 Royal Palm Dr., Fremont, Calif. 95438

Filed Mar. 10, 1980, Ser. No. 129,085
Int. Cl.³ B03B 5/02
U.S. Cl. 209—447 4 Claims



1. A device for separating heavy precious metals from a placer material comprising:

a pan having a generally circular bottom and an upwardly and outwardly extending side wall formed integrally therewith,

a centrally located aperture leading to a trough formed integrally with said pan, said trough sloping downwardly from the pan at least 10° and not more than 45°, and

a ladder-like structure within said trough for retrieving said precious metals from said placer material.

4,273,649
APPARATUS AND PROCESS FOR WEIGHING ARTICLES SUCCESSIVELY

William H. Leverett, P.O. Box 1404, LaGrange, Ga. 30241

Filed Nov. 24, 1978, Ser. No. 963,581
Int. Cl.³ B07C 5/16
U.S. Cl. 209—539 35 Claims

1. An article weighing machine for weighing and sorting according to weight ranges, articles of fruit or vegetables comprising:

(a) a feed conveyor for conveying spaced successive articles on said conveyor along a prescribed path through a weighing zone;

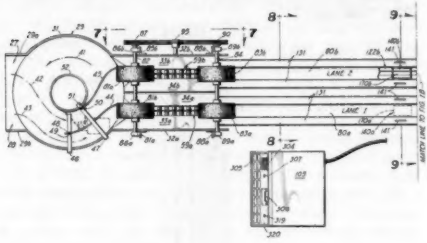
(b) sensing means for sensing the presence of each article in said path;

(c) weighing means in said weighing zone for weighing said successive articles;

(d) gate means connected to said weighing means for ejecting the articles from said feed conveyor at different locations along said path;

(e) counting means connected to said conveyor for providing clock signals proportional in number to the distance travelled by said conveyor; and

(f) random access computer means having weight ranges written into its memory, said computer means being connected to said weighing means and said gate means and said counting means and said sensing means, said computer being actuated by said sensing means and said weighing means for accessing the memory for the distances which the respective articles are to travel along said path and for actuating the ejecting operation of selected gate means, according to the weight of the respective articles when the clock pulses indicate tht such distances have been travelled by such articles, so as to eject articles within a similar first weight range in one location along said path and articles within a similar second weight range in another location.

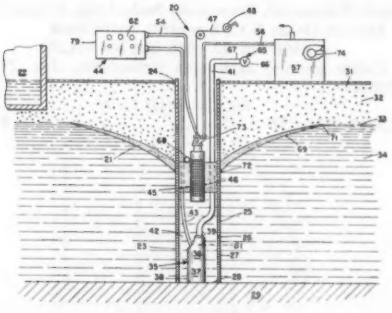


4,273,650

APPARATUS AND METHOD FOR RECOVERING POLLUTANT LIQUIDS

Harold W. Solomon, Nashua, N.H., assignor to Emtek Incorporated, Amherst, N.H.

Filed Jan. 10, 1979, Ser. No. 111,012
Int. Cl.³ E02B *15/08*
U.S. Cl. 210—104 **12 Claims**



1. An automatic, pollutant recovery system for use in recovering pollutant from a recovery well in an area known to have pollutant spilled into the ground water, said system comprising:

an apertured, screen-like, well casing having a side wall with holes therein, extending from ground level down to substantially below the static water table to allow free movement of water and pollutants into the well;

a submergible, draw-down, electrically powered pump submerged at the bottom of said well and having a water discharge conduit for discharging water therefrom;

water discharge control means including said pump and a pump switch for controlling the flow of water from said well to establish and maintain by gravity flow a predetermined water level at a spaced distance below the static water table and thereby establish and maintain a cone of depression encircling said well without centrifugal separation;

a pollutant recovery tank;

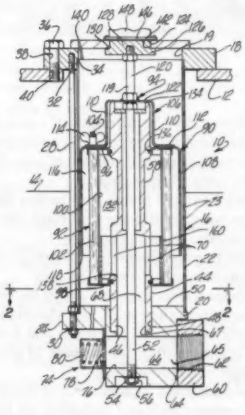
combined pollutant pump and sensor means including an electrically powered pollutant pump, a pump switch and sensors, responsive to pollutant level to actuate said switch, supported in said well at the level of the apex of said cone of depression and at the water level maintained by said draw down pump and by said water discharge control means, for sensing a low level water/pollutant interface and energizing said pollutant pump to pump pollutant into said tank while permitting the water/pollutant interface to rise and for sensing a high level water/-pollutant interface and de-energizing said pollutant pump.

4,273,651

RETURN LINE FILTER

Nils O. Rosaen, 5490 Waldon, Clarkston, Mich. 48016

Filed Aug. 20, 1979, Ser. No. 67,446
Int. Cl.³ B01D *27/10*
U.S. Cl. 210—130 **13 Claims**



1. For use with a fluid system having a fluid reservoir at least partly filled with fluid to a fluid level, a fluid filtering device comprising:

an elongated housing having an open top at least a partially open bottom and an inner portion extending upwardly from said bottom, said housing being positioned within said reservoir so that the lower end of the housing is submerged in the fluid reservoir fluid, said housing having a fluid inlet formed on its lower end;

a filter assembly comprising a tubular filter element open at each end and a holder assembly detachably secured at one end to one axial end of the tubular filter element, the other end of the filter element being slidably insertable through the open top of the housing and over a portion of said housing so that said housing inner portion extends entirely axially through said filter element, said filter element being spaced radially outwardly from said housing inner portion thus forming an annular inlet chamber therebetween;

means for fluidly sealing both axial ends of the filter element to said housing inner portion;

fluid passage means formed through said housing for fluidly connecting said housing inlet with said annular inlet chamber; and

means attached to said holder assembly for diverting fluid flow through said filter element toward the partially open bottom of the housing which is positioned below fluid level.

4,273,652

INSTALLATION FOR FILTRATION OF A CONTAMINATED FLUID

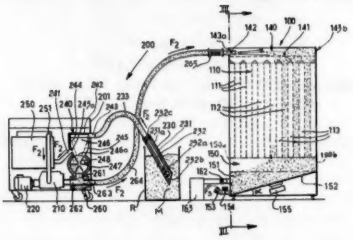
Jean-Claude Lucas, Saint Nom La Breteche, and Pierre Messirejean, Chantilly, both of France, assignors to Societe Sofiltra-Poelman and Societe Industrielle de Filtration, both of La Garenne Colombes, France

Filed Aug. 28, 1979, Ser. No. 70,424

Claims priority, application France, Sep. 8, 1978, 78 25837

Int. Cl.³ B01D *15/02*

U.S. Cl. 210—189 **19 Claims**



18. An installation for the filtration of a contaminated fluid stream, the installation comprising, in combination:

a supply of granular material capable of adsorbing or absorbing contaminants in the stream;

a filtration tank having a plurality of baffles therein to define at least one substantially vertical filter bed for receiving granular material from the supply;

means for directing the fluid stream through the filter bed to remove contaminants from the stream;

a charging compartment disposed above the filtration tank in close juxtaposition therewith, the charging compartment having a pair of opposed end walls and a perforated bottom plate for permitting the passage of granular material therethrough to the filter bed;

nozzle means positioned adjacent one of the end walls of the charging compartment and including an injection nozzle for directing granular material horizontally along a discharge axis which extends perpendicular to the planes of said baffles, the discharged material accumulating on the perforated bottom plate and passing through the perforations therein to fill the filter bed;

a discharging compartment beneath the filtration tank in communication with the filter bed therein, the discharging compartment including a hopper having a discharge fitting and a dihedron shaped bottom, the arris of the bottom being inclined with respect to the horizontal; and

aspirating means selectively connectable to the charging compartment and the discharging compartment, the aspirating means including a receptacle for contaminated granular material, a discharge conduit communicating with the receptacle, a centrifugal dust-removing device having an inlet and a pair of outlets, and a pressure-reducing device communicating with one of said outlets, the inlet of the dust-removing device communicating with the supply of granular material and the other outlet communicating with the nozzle means when the aspirating means is connected to the charging compartment, and the inlet communicating with said receptacle and the discharge conduit communicating with the discharge fitting on said hopper when the aspirating means is connected to the discharging compartment.

4,273,653

MICROCHROMATOGRAPHIC SYSTEM FOR MEDICAMENT INTAKE CONTROL

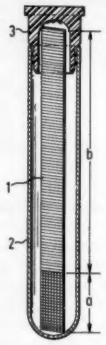
Michael Uihlein, Kriftel, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 19, 1980, Ser. No. 122,732

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1979, 7904648[U]

Int. Cl.³ B01H *15/08*

U.S. Cl. 210—198.3 **3 Claims**



1. Microchromatographic system, which consists of a test tube serving as developing chamber (**2**) and being closed by a stopper (**3**), and a thin-layer plate or foil in the form of a strip (**1**) fitting into the test tube, said plate or foil being coated in its lower quarter with a layer for concentration and purification (a) which merges without interruption into a thin-layer chromatographic separating layer (b) covering the remainder of the strip.

4,273,654

SEPARATION DEVICE

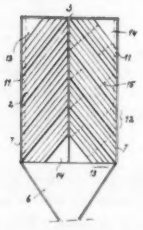
Jacob Pielkenrood, Krommenie, Netherlands, assignor to Pielkenrood-Vinitex B.V., Assendelft, Netherlands

Filed Jun. 20, 1980, Ser. No. 161,289

Claims priority, application Netherlands, Jun. 27, 1979, 7905021

Int. Cl.³ B01D *21/00*

U.S. Cl. 210—232 **8 Claims**



1. A device for separating from a liquid components suspended therein, comprising an assembly of substantially parallel corrugated plates arranged in a basin at an angle with the horizontal plane, between which plates separation passages are defined, which plates are provided with mutually parallel

corrugations having generatrices which include an angle of less than 90° with the line of maximum inclination of the plates, two opposite transverse walls of the basin, joining the oblique lateral edges of the plates, forming a connection with a liquid supply and discharge chamber respectively, the shape and dimensions thereof substantially corresponding to the cross-section of the plate assembly parallel to these walls, which chambers are connected to a liquid supply and discharge duct respectively, in such a manner that the liquid flow between these chambers is directed substantially transversely to the corrugations of these plates, the lowest or highest terminal edges respectively of these plates joining collecting ducts for heavy or light components respectively, which are collected in the lowest or highest parts respectively of the plate corrugations and slide along these parts towards the extremity in question, at which extremity of the corrugated plates guiding baffles are provided which are directed towards a collecting chamber for the component in question, which baffles are adapted to prevent a liquid flow past the plate assembly, said corrugated plates extending up to the lateral walls in question of the basin, and contacting the lateral walls of the basin compartment in which the plates are arranged, at their lower edges with their corrugation tops and at their higher edges with their corrugation valleys, there being a distance between the corrugation valleys and tops respectively and the lateral wall in question, and, thus, forming a discharge passage for the separated component flowing off at that extremity, and in that the guiding baffles are mounted against the lateral wall in question, and are aligned with a series of superposed corrugation valleys or tops respectively.

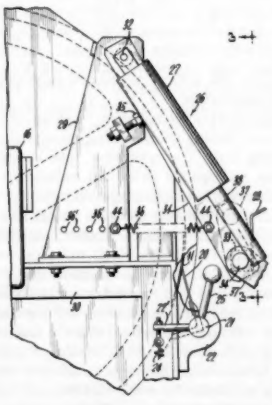
4. The device of claim **1**, further in which the plate assembly consists of subassemblies, each comprising a plurality of interconnected plates of substantially the same length kept at the correct distance by means of distance pieces, which subassemblies have a substantially parallelogram-shaped cross-section in a plane through corresponding generatrices of superposed plates.

4,273,655

DOCTOR BLADE CLEANING METHOD AND APPARATUS

Robert A. Reid, Charlton City, Mass., assignor to CPC Engineering Corporation, Sturbridge, Mass.

Filed Dec. 10, 1979, Ser. No. 102,235
Int. Cl.³ B01D *33/36;* A46B *13/02*
U.S. Cl. 210—396 **10 Claims**



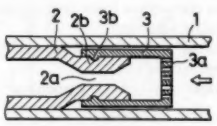
1. Means for cleaning a doctor blade positioned in engagement with a rotating structure for the removal of solids from the surface thereof, said cleaning means comprising a cleaning blade extending lengthwise of said doctor blade and means for moving said cleaning blade transversely of said doctor blade through an arcuate path from one position in contact with said doctor blade, over the surface of said doctor blade to a second retracted position extending away from said doctor blade, said cleaning blade includes a fixedly positioned offset end portion extending toward the line of engagement of said doctor blade with said rotating structure when in said one position and said cleaning means includes means for periodically and arcuately moving said cleaning blade from said retracted position to and from said one position and means coupled to said moving means for urging the offset portion of said cleaning blade into pressure contact with said doctor blade.

4,273,656

FILTER FOR FLUID PASSAGE

Hisaharu Arai, Nagoya, Japan, assignor to Aisan Industry Co., Ltd., Aichi, Japan

Filed Apr. 26, 1979, Ser. No. 33,663
Claims priority, application Japan, May 9, 1978, 53-54601
Int. Cl.³ B01D *27/00*
U.S. Cl. 210—448 **7 Claims**



1. A filter for use in a fluid passage, comprising

a solid non-porous non-deformable cylindrical filter body having a bottom wall and one open end portion having a terminal end of said filter body remote from said bottom wall, said bottom wall constituting a filter screen formed with a plurality of bores,

said filter body having an annular projection formed on said open end portion on one circumferential surface thereof,

said filter body constituting an integral one-piece unit made of elastic material, said filter body having elasticity at said one open end portion,

a restriction member disposed in said fluid passage and having a narrowed constricting portion defining an outer peripheral surface spaced from an inner surface of the fluid passage, said restriction member defining a central opening therethrough,

said cylindrical filter body at said open end portion being fitted around said constricting portion of said restriction member covering said constricting portion and with said filter screen disposed adjacent said central opening of said constricting portion,

said outer peripheral surface of said constricting portion and the inner surface of the fluid passage constituting peripheral surfaces,

said annular projection on said open end portion of said filter body being elastically radially press-fitted onto one of said peripheral surfaces constituting elastic connecting element means for connecting said cylindrical filter body fluid-tightly to said one of said peripheral surfaces, said other of said peripheral surfaces being annularly spaced from said cylindrical filter body.

4,273,657

TWO-STAGE FLOTATION PURIFICATION OF NaOH

Raymond H. Conageski, Montague, Mich., and Joseph D. Paciotti, Corpus Christi, Tex., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

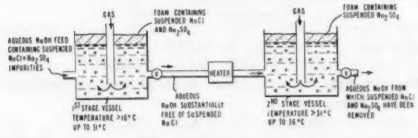
Filed Jun. 14, 1979, Ser. No. 48,589
Int. Cl.³ B03D *1/02*
U.S. Cl. 210—703 **10 Claims**

1. A process for purifying an aqueous solution containing less than 52 weight percent of NaOH and containing suspended NaCl and Na_2SO_4 impurities, comprising:

(i) bubbling a gas into the impurity-containing NaOH solution at a temperature above 16° C. up to 31° C., to transport suspended impurities to the surface of the NaOH solution and form a surface foam layer on the NaOH solution;

(ii) separating the surface foam layer of impurities from the NaOH solution;

(iii) bubbling a gas into the NaOH solution from step (ii) at a temperature above 31° up to about 36° C., to transport


GAS
FOAM CONTAINING SUSPENDED NaCl AND Na_2SO_4
AQUEOUS NaOH FEED CONTAINING SUSPENDED NaCl+Na_2SO_4 IMPURITIES
HEATER
AQUEOUS NaOH SUBSTANTIALLY FREE OF SUSPENDED NaCl
AQUEOUS NaOH FROM WHICH SUSPENDED NaCl AND Na_2SO_4 HAVE BEEN REMOVED

suspended impurities to the surface of the NaOH solution and form a surface foam layer on the NaOH solution;

(iv) separating the surface foam layer of impurities from the aqueous NaOH solution;

whereby substantially all of the suspended NaCl impurity is removed by steps (i) and (ii);

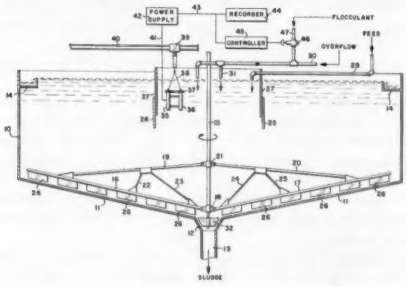
whereby substantially all of the suspended Na_2SO_4 impurity remaining after steps (iii) and (iv).

4,273,658

THICKENER CONTROL PROCESS

James S. Karman, Evansville, Wyo., assignor to Exxon Production Research Company, Houston, Tex.

Continuation of Ser. No. 843,471, Oct. 19, 1977, abandoned.
This application Sep. 25, 1979, Ser. No. 78,973
Int. Cl.³ C02F *1/52*
U.S. Cl. 210—709 **12 Claims**



1. A method for controlling the operation of a continuous gravity sedimentation unit having a feed well into which a slurry of suspended solids and a flocculating agent are introduced to effect separation of said slurry into a clarified solution that is recovered from said unit as an overflow liquid and a sludge that is withdrawn from the bottom of said unit whereby consumption of flocculating agent is reduced comprising the steps of establishing a slime level within a predetermined optimum distance from the bottom of said feed well by varying the flow rates to and from said unit, detecting changes in the density of the downflowing slurry over a vertical interval in said feed well, correlating said density changes in the solids settling rate within said well, and continuously varying the rate at which said flocculating agent is introduced into said feed well in response to said changes in density and whereby control of both settling rate and slime level is obtained.

4,273,659

REMOVING POTASSIUM SALTS FROM DISTILLER'S WASH

Andrea Robertiello, and Ludwig Degen, both of Rome, Italy, assignors to E.N.I. Ente Nazionale Idrocarburi, Rome, Italy

Filed Sep. 12, 1979, Ser. No. 74,742
Claims priority, application Italy, Sep. 19, 1978, 27827 A/78
Int. Cl.³ C02F *1/54*
U.S. Cl. 210—728 **2 Claims**

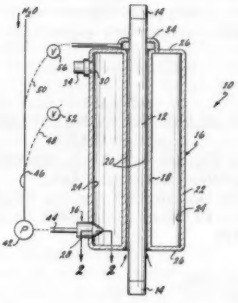
1. A process for the removal of potassium ions from distillers' wash which is a waste product from the distillation of beet molasses consisting essentially of: adding to said distillers' wash an acid the potassium salts of which are poorly soluble, said acid is selected from the group consisting of sulphuric, nitric, hydrochloric, perchloric, iodic, chromic, tartaric and oxalic acids, and an organic solvent selected from the group consisting of aliphatic alcohols, the ketones, and the volatile esters, in quantities sufficient to cause said potassium ions to precipitate as potassium salts; separating out the precipitated salts from the solvent and the distillers' wash; and recovering said organic solvent from the distiller's wash by distillation.

4,273,660

PURIFICATION OF WATER THROUGH THE USE OF OZONE AND ULTRAVIOLET LIGHT

Stuart W. Beitzel, 1480 Cabrillo Park Dr. #A, Santa Ana, Calif. 92701

Division of Ser. No. 13,145, Feb. 21, 1979, Pat. No. 4,189,363.
This application Oct. 29, 1979, Ser. No. 89,139
Int. Cl.³ C02F *1/50*
U.S. Cl. 210—760 **17 Claims**



1. A process for killing microbiological contaminants in water which comprises:

transmitting ultraviolet radiation from an ultraviolet radiation source having an elongated, tubular shape through a separating wall of a cylindrical tube concentrically surrounding and spaced from said radiation source, which separating wall is spaced from said radiation source so that the space between said radiation source and said separating wall serves as a first container, said separating wall being transparent to ultraviolet radiation, said wall serving as an interior wall of a second container having a cylindrical outer wall located concentrically around said separating wall, said separating wall separating said first and said second containers so that the radiation from said source is present within both of said containers,

passing a stream of air along said radiation source through said first container from one end thereof to the other end thereof so as to allow said ultraviolet radiation in said first container to convert oxygen therein to ozone so as to form an ozone-air mixture,

entraining the ozone-air mixture within a stream of water so as to form a liquid-gas mixture,

subjecting said gas-liquid mixture to a shearing action while

compressing said mixture so as to break up the gas bubbles within said mixture while concurrently introducing said mixture into said second container adjacent to an end thereof,

passing said liquid-gas mixture through said second container between the ends thereof so that said liquid-gas mixture is exposed to ultraviolet radiation within said second container as said mixture passes between the ends of said second container.

12. An apparatus for killing microbiological contaminants in water which comprises:

first and second elongated tubular, concentric cylindrical containers separated by a common wall transparent to ultraviolet radiation,

an ultraviolet radiation source for transmitting ultraviolet radiation through the interiors of both of said containers and through said wall concentrically located along the axis of said first container,

means for allowing air to enter one end of said first container,

means for withdrawing air from the other end of said first container and for entraining said withdrawn air with a stream of water and for conveying said entrained air-water mixture to adjacent to an end of said second container,

nozzle means for introducing said entrained air-water mixture into said second container adjacent to said end of said second container so that said air-water mixture will move under turbulent conditions to the other end of said second container, said nozzle means including an internal restriction within which said air-water mixture is compressed and is subjected to a shearing action as said air-water mixture is introduced into said second container, and

means for removing an air-gas mixture from said other end of said second container.

4,273,661

ARTICLE FOR DISPENSING LIQUID BLEACH SOFTENER COMPOSITION

Seymour Grey, Somerset, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed May 25, 1978, Ser. No. 909,331
Int. Cl.[2] D06M *13/34*
U.S. Cl. 252—8.8 **13 Claims**

1. An article for dispersing liquid bleach-softener composition in one or more of the wash, rinse and tumble dry cycles of a fabric laundering process comprising a flexible, foam retaining, open cell polymeric foam substrate impregnated with a liquid composition containing an effective bleaching and softening amount of water soluble peroxy bleaching agent and water soluble softener of the quaternary ammonium and/or heterocycle imide type in a weight ratio of softener to bleach of about 5:7 to 5:1, at least about 50% of said peroxy bleach being hydrogen peroxide.

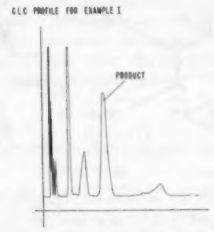
4,273,662

2-OXABICYCLOOCTANE DERIVATIVES, PROCESSES FOR PREPARING SAME AND ORGANOLEPTIC USES THEREOF

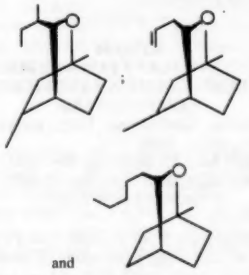
Mark A. Sprecker, Sea Bright; Frederick L. Schmitt, Holmdel; Manfred H. Vock, Locust; Joaquin F. Vinals, Red Bank, all of N.J., and Jacob Kiwala, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 52,335, Jun. 27, 1979, Pat. No. 4,235,729, which is a division of Ser. No. 8,924, Feb. 2, 1979, Pat. No. 4,197,238, which is a continuation-in-part of Ser. No. 953,128, Oct. 20, 1978, Pat. No. 4,195,099. This application Feb. 8, 1980, Ser. No. 120,103
Int. Cl.[3] D06M *13/18*
U.S. Cl. 252—8.9 **1 Claim**

1. A process for augmenting or enhancing the aroma of an optical brightener composition comprising the step of intimately admixing with an optical brightener composition an aroma augmenting or enhancing quantity of at least one cyclic



chemical compound having a structure selected from the group consisting of:



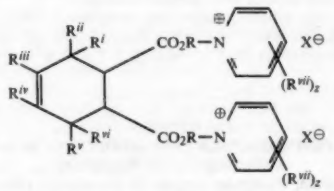
4,273,663

QUATERNARY AMMONIUM DIESTER SALT COMPOSITION AND LUBRICATING OIL CONTAINING SAME

Kenneth G. Hammond, and Harry Chafetz, both of Poughkeepsie, N.Y., assignors to Texaco Inc., White Plains, N.Y.

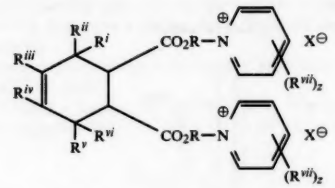
Filed Nov. 13, 1979, Ser. No. 93,481
Int. Cl.[3] C10M *1/32*
U.S. Cl. 252—34 **31 Claims**

1. A quaternary ammonium diester salt composition represented by the formula:



in which R^i, R^{ii}, R^{iii}, R^{iv}, R^v R^{vi} represent hydrogen, alkyl or alkenyl hydrocarbyl radicals at least one of which is a hydrocarbyl radical having from 50–200 carbon atoms, R is a divalent radical having from 2–10 carbon, or carbon and oxygen atoms, R^{vii} is hydrogen or a hydrocarbyl radical, z has a value from 0–4 and X is an anion selected from the group consisting of halides, sulfates, carbonates, sulfites, borates, carboxylates, and phosphates.

13. A lubricating oil composition comprising a major portion of a mineral lubricating oil and a minor dispersant amount of a quaternary ammonium diester salt composition represented by the formula:



in which R^i, R^{ii}, R^{iii}, R^{iv}, R^v, and R^{vi} represent hydrogen, alkyl or alkenyl hydrocarbyl radicals at least one of which is a hydrocarbyl radical having from 50–200 carbon atoms, R is a divalent radical having from 2–10 carbon, or carbon and oxygen atoms, R^{vii} is hydrogen or a hydrocarbyl radical, z has a value from 0 to 4, and X is an anion selected from the group consisting of halides, sulfates, carbonates, sulfites, borates, carboxylates, and phosphates.

4,273,664

RUST-PREVENTING AGENT FOR AQUEOUS SYSTEMS AND RUST-INHIBITING LUBRICATING COMPOSITIONS

Ernesto Brandolese, Graffignana, Italy, assignor to Snamprogetti S.p.A., Milan, Italy

Filed May 22, 1979, Ser. No. 41,437
Claims priority, application Italy, Jun. 2, 1978, 24135 A/78
Int. Cl.³ C10M 1/06
U.S. Cl. 252—49.5 14 Claims

1. Rust-preventing agent for aqueous systems composed of the amine salt which is the monoamide of adipic acid with propanolaniline, the acidic function of said amide being salified with monoethanolamine.

4. Rust-preventing agent for aqueous systems composed of the amine salt which is the monoamide of adipic acid with aniline and which has been N-oxyethylated with 5 moles of ethylene oxide, the acidic function of said amide being salified with monoethanolamine.

7. Rust-preventing agent for aqueous systems composed of the amine salt which is the monoamide of maleic acid with p.nitro-N-methylaniline, the acidic function of said amide being salified with monoethanolamine.

10. Rust-preventing agent for aqueous systems composed of the amine salt which is the monoamide of glutaric acid with dodecylamino-N-(polyoxyethylene) amine in which the degree of oxyethylation is equal to 10, the acidic function of said amide being salified with monoethanolamine.

13. A rust-inhibiting lubricating composition characterized by an aqueous mixture containing from 0.5% to 50% by weight of amine salt as set forth in claims 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 or 12.

4,273,665

FRICTION REDUCING ADDITIVES AND COMPOSITIONS THEREOF

Milton Braid, Westmont; Andrew G. Horodysky, Cherry Hill, and Joan M. Kaminski, Clementon, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 9, 1979, Ser. No. 83,068
Int. Cl.³ C10M 1/32
U.S. Cl. 252—49.6 20 Claims

1. A lubricant composition comprising a major proportion of an oil of lubricating viscosity or a grease prepared therefrom and a minor effective proportion of a friction reducing or friction modifying additive selected from the group consisting of a hydrolyzed derivative of a 1-(2-hydroxyalkyl)-2-alkylimidazoline, a 1-(2-hydroxyalkyl)-2-alkenylimidazoline and borated derivatives thereof wherein said alkyl or alkenyl portion of said imidazoline contains from about 9 to 29 carbon atoms and said alkyl portion of the hydroxyalkyl moiety contains from 1 to 6 carbon atoms.

4,273,666

HYDRATED $MG(NO_3)_2$ REVERSIBLE PHASE CHANGE COMPOSITIONS

George A. Lane, and Harold E. Rossow, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 2, 1979, Ser. No. 90,784
Int. Cl.³ C09K 5/06
U.S. Cl. 252—70 17 Claims

1. A reversible liquid/solid phase change composition comprising hydrated $Mg(NO_3)_2$ and as a nucleating additive, one or more of $Sr(OH)_2$, $SrCO_3$, $Ba(OH)_2$, BaO, $BaCO_3$ or $NaBO_2$, added to the composition in an amount effective to suppress average supercooling of the $Mg(NO_3)_2$ liquid phase to about 2° C. or less.

4,273,667

THERMAL ENERGY STORAGE MATERIAL COMPRISING HYDRATED COMPOUND AND WATER-SWOLLEN CROSS-LINKED POLYMER

Peter J. C. Kent, High Wycombe, and John K. R. Page, Camberley, both of England, assignors to The Calor Group Limited

Continuation-in-part of Ser. No. 88,514, Oct. 26, 1979, abandoned. This application Feb. 27, 1980, Ser. No. 125,263
Claims priority, application United Kingdom, Nov. 10, 1978, 44117/78
Int. Cl.³ C09K 5/06
U.S. Cl. 252—70 11 Claims

1. In a thermal energy storage material which comprises at least one hydrated compound which has a reversible transition to the anhydrous or a less hydrated form and a minor amount of hydrogel throughout which said compound is dispersed, the improvement comprising that the hydrogel comprises a water-swollen cross-linked polymer formed by cross-linking a synthetic hydrophilic polymer by a covalent cross-linking mechanism.

4,273,668

ARYLSULFONIUM SALT-SOLVENT MIXTURES

James V. Crivello, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 833,146, Sep. 14, 1977, Pat. No. 4,161,478, which is a continuation-in-part of Ser. No. 789,419, Apr. 21, 1977, Pat. No. 4,136,102, which is a division of Ser. No. 574,006, May 2, 1975, which is a continuation-in-part of Ser. No. 466,374, May 2, 1974, abandoned, Ser. No. 466,375, May 2, 1974, abandoned, and Ser. No. 466,378, May 2, 1974, abandoned. This application Jun. 18, 1979, Ser. No. 49,296
Int. Cl.³ B01J 31/12; G03C 1/68
U.S. Cl. 252—182 6 Claims

1. A stable aryl onium salt-solvent mixture comprising

(A) 1% to 75% by weight of aryl onium salt of the formula,

$$[(R)_a(R^1)_b(R^2)_cX]^+[MF_6]^-$$

and

(B) 99% to 25% by weight of a cyclic carbonate selected from the class consisting of ethylene carbonate and propylene carbonate based on the total weight of (A) and (B), where R is a monovalent aromatic organic radical, R^1 is a monovalent organic aliphatic radical, selected from alkyl, cycloalkyl and derivatives thereof, R^2 is a polyvalent organic radical forming a heterocyclic or fused ring structure, selected from aliphatic radicals and aromatic radicals, X is a Group VIa element selected from sulfur and selenium, M is selected from P, As and Sb, a is a whole number equal to 0 to 3 inclusive, b is a whole number equal to 0 to 2 inclusive, c is a whole number equal to 0 or 1 and the sum of a+b+c is equal to 3 or the valence of X.

4,273,669

LATENT CURING AGENT FOR THERMOSETTING AMINOPLAST RESINS, ITS MANUFACTURE AND ITS USE

Steffen Piesch, Oberursel; Peter Dörries, Frankfurt am Main; Ewald Schmidt, Hanau, and Richard Hensel, Maintal, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main-Fechenheim, Fed. Rep. of Germany

Filed Mar. 17, 1980, Ser. No. 130,701

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1979, 2911265

Int. Cl.[3] C08K *3/30, 5/05, 5/17*

U.S. Cl. 252—182 6 Claims

1. A latent curing agent for aminoplast resins comprising the reaction product of diethanolamine, glycidol and SO_2 in a molar ratio of 1:(1.0 to 1.2):(0.5 to 1.0), respectively.

4,273,670

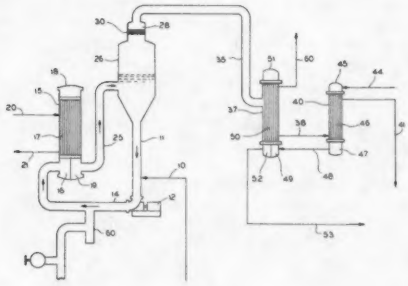
APPARATUS FOR AND METHOD OF REMOVING RADIOACTIVE BOTTOMS FROM AN EVAPORATOR

Peter J. Cheng, Wheaton; Jay D. Dockendorff, Downers Grove, and Ernest L. Wright, Lombard, all of Ill., assignors to HPD Incorporated, Naperville, Ill.

Filed Mar. 16, 1979, Ser. No. 20,642

Int. Cl.[3] G21F *9/08*

U.S. Cl. 252—301.1 W 5 Claims



1. In an apparatus for concentrating low radioactive aqueous waste containing dispersed and dissolved materials including a forced circulation evaporator, a feed tank for holding said low radioactive aqueous waste, and a conduit for supplying low radioactive aqueous waste from the feed tank to the evaporator, the improvement comprising:

a drain valve in the evaporator for removing concentrated radioactive bottoms from the evaporator,

a drain conduit from the drain valve to a pump,

a rinse water conduit, containing a first valve, communicating with the drain conduit,

a delivery conduit, from the pump to a bottoms storage tank, containing a second valve,

a branch conduit, in communication with the delivery conduit between the pump and the second valve and extending to said feed tank, containing a third valve,

means operating the pump, with the drain valve closed and the drain conduit delivery conduit and branch conduit full of rinse water, and opening the drain valve and the third valve to thereby convey the water in the said conduits to the feed tank before bottoms removed from the evaporator reach the third valve,

means closing the third valve and opening the second valve to deliver the bottoms removed from the evaporator to the bottoms tank,

means opening the first valve in the rinse water conduit, closing the second valve to the bottoms tank and opening the third valve to the feed tank to back flush the drain valve and dilute bottoms in the conduits and deliver the diluted bottoms to the feed tank,

means closing the drain valve to discontinue removal of bottoms from the evaporator while flushing the conduits with rinse water by maintaining the first valve open and delivering the rinse water to the feed tank, and

means closing the first valve, the third valve and stopping the pump with the conduits and pump full of rinse water.

4,273,671

FLUORESCENT DETECTION OF FLAWS

Sidney Allinikov, Yellow Springs, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 18, 1979, Ser. No. 76,631

Int. Cl.[3] G09K *11/06;* G01N *19/08*

U.S. Cl. 252—301.19 3 Claims

1. A product for use in the non-destructive testing of a workpiece to detect cracks or flaws in the surface thereof which consists essentially of a multiplicity of dry, non porous, spherical, thin walled, compressible plastic microcapsules each having encapsulated therein a fluorescent dye detectible by ultraviolet light, and each of said microcapsules having a diameter ranging from 1 to 150 microns together with a wall thickness of about 0.5 to 1.0 microns.

4,273,672

MICROENCAPSULATION PROCESS

Anthony E. Vassiliades, Deerfield, Ill., assignor to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 174,045, Aug. 23, 1971, Pat. No. 3,886,084, which is a continuation-in-part of Ser. No. 583,046, Sep. 29, 1966, abandoned. This application Mar. 6, 1974, Ser. No. 448,731

The portion of the term of this patent subsequent to May 27, 1992, has been disclaimed.

Int. Cl.[3] B01J *13/02*

U.S. Cl. 252—316 6 Claims

1. A process for the formation of microcapsules having non-proteinaceous walls, in the absence of coacervation, which comprises the steps of:

(A) forming a primary oil-in-water emulsion, which emulsion comprises a water-immiscible oily material dispersed in the form of microscopic droplets in a colloidal solution of a non-proteinaceous, polymeric emulsifying agent having about the same hydrophil-lipophil balance as the oily material, said emulsifying agent being selected from the group consisting of an emulsifying agent possessing cross-linkable groups and an emulsifying agent possessing complexing sites; and

(B) forming an impermeable coating around said dispersed oil droplets solely by adding to the aqueous phase of said emulsion a member different from said emulsifying agent and selected from the group consisting of gum tragacanth and a borate under conditions of brisk agitation, said member reacting with said non-proteinaceous emulsifying agent so as to form a non-proteinaceous impermeable coating around said dispersed oil droplets.

4,273,673

RUST INHIBITORS AND COMPOSITIONS OF SAME

Shoji Kimura, Heiwa, and Noboru Ishida, Kanagawa, both of Japan, assignors to Nippon Oil Company Ltd., Tokyo, Japan

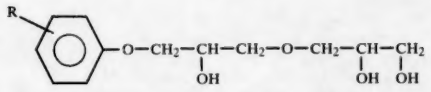
Division of Ser. No. 958,632, Nov. 8, 1978, abandoned. This application Aug. 23, 1979, Ser. No. 68,901

Claims priority, application Japan, Nov. 30, 1977, 52-142602

Int. Cl.[3] C23F *11/12*

U.S. Cl. 252—396 4 Claims

1. A composition having rust preventing ability which comprises (A) a glycerol-1-alkylphenoxy-3-glycerol ether of the formula



wherein R is an alkyl radical with 9, 12 or 15 carbon atoms and (B) a mineral oil in a weight ratio of 0.01–20 parts of (A) per 100 parts of (B).

4,273,674

THERMAL DETECTING PAINT COMPOSITIONS

Woodfin V. Ligon, Jr., Schenectady, and Jimmy L. Webb, Ballston Lake, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 869,140, Jan. 13, 1978, abandoned, which is a continuation-in-part of Ser. No. 806,600, Jun. 15, 1977, abandoned. This application Nov. 26, 1979, Ser. No. 97,350

Int. Cl.[3] **C09D** *5/26, 3/58, 3/64;* **C09K** *3/00;* **G01K** *11/00, 13/00*

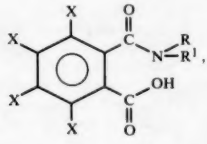
U.S. Cl. 252—408 **28 Claims**

1. A composition for application to designated portions of a turbine generator and which is useful in determining the location of overheating, said composition comprising

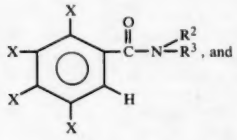
(a) a coating composition comprising an organic resin having a thermal particulation temperature below 250° C. and

(b) from 0.1% to 0.5% by weight of a tagging compound selected from the group consisting of:

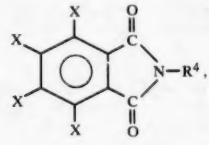
(1) an organic compound of the formula



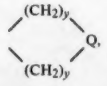
(2) an organic compound of the formula,



(3) an organic compound of the formula,



where X is a halogen radical, R and R^1 are separately selected from $C_{(1-23)}$ alkyl radicals, which together total $C_{(12-24)}$ carbon atoms, $C_{(6-20)}$ cycloalkyl radicals and heterocyclic radicals, where the divalent heterocyclic radical joined to N has the formula,



Q is selected from —O—, —S— and $—SO_2—$, y and z are integers having a value of 1 to 23 inclusive while together total 12 to 24, R^2 and R^3 are separately selected from $C_{(1-23)}$ alkyl radicals, which together total $C_{(12-24)}$ carbon atoms and $C_{(6-20)}$ cycloalkyl radicals, R^4 is selected from $C_{(6-20)}$ alkyl and cycloalkyl.

17. A coating composition in accordance with claim **1**, wherein the tagging compound has been microencapsulated with a natural or synthetic resin.

4,273,675

PROCESS FOR THE PREPARATION OF SPHERICAL CARBON PARTICLES AND SPHERICAL ACTIVATED CARBON PARTICLES

Zenya Shiiki, and Kazuhiro Watanabe, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 31, 1979, Ser. No. 62,299

Claims priority, application Japan, Aug. 11, 1978, 53/97820

Int. Cl.[3] **C01B** *31/10, 31/08, 31/02;* **B01J** *21/18*

U.S. Cl. 252—424 **8 Claims**

1. A process for producing spherical carbon particles, wherein a pitch or a heavy oil of a softening point below 150° C. is mixed with an organic solvent to reduce the viscosity thereof, the mixture is fused and shaped into spherical particles, said organic solvent in said spherical particles is extracted with a solvent incapable of dissolving said pitch or heavy oil but capable of dissolving said organic solvent to obtain porous spherical particles, the thus obtained porous spherical particles are subjected to a treatment of infusibilization in an oxidizing atmosphere whereafter the thus infusibilized particles are carbonized, characterized in that

at least one material capable of elevating said softening point of said pitch or heavy oil and selected from the group consisting of mononitro aromatic compounds, polynitro aromatic compounds, quinones and polycarboxylic acid anhydrides, and

a material capable of preventing the formation of voids within said particles and selected from the group consisting of fluid paraffin, solid paraffin, polyethylene, alicyclic hydrocarbons, alkylcyclohexanes, stearyl alcohol, lauryl alcohol, cetyl alcohol, and silicone oil,

are mixed with said pitch or heavy oil thereby to elevate the softening point of said pitch or heavy oil and to prevent said formation of voids within said spherical particles.

2. A process according to claim **1**, wherein said material capable of elevating said softening point of said pitch or heavy oil is used in an amount of 0.2 to 20% by weight based on said pitch or heavy oil.

5. A process for producing spherical activated carbon particles, wherein a pitch or heavy oil of a softening point below 150° C. is mixed with an organic solvent to reduce the viscosity thereof, the mixture is fused and shaped into spherical particles, said organic solvent in said spherical particles is extracted with a solvent incapable of dissolving said pitch or heavy oil but capable of dissolving said organic solvent to obtain porous spherical particles, the thus obtained porous spherical particles are subjected to a treatment of infusibilization in an oxidizing atmosphere, carbonizing the thus infusibilized particles, whereafter the thus carbonized particles are activated, characterized in that,

at least one material capable of elevating said softening point of said pitch or heavy oil and selected from the group consisting of mononitro aromatic compounds, polynitro aromatic compounds, quinones and polycarboxylic acid anhydrides, and

a material capable of preventing the formation of voids within said particles and selected from the group consisting of fluid paraffin, solid paraffin, polyethylene, alicyclic hydrocarbons, alkylcyclohexanes, stearyl alcohol, lauryl alcohol, cetyl alcohol, and silicone oil,

are mixed with said pitch or heavy oil thereby to elevate the

softening point of said pitch or heavy oil and to prevent said formation of voids within said spherical particles.

4,273,676

PROCESS FOR PRODUCING METHACRYLIC ACID AND A CATALYST

Mutsumi Matsumoto; Hideki Sugi, both of Takasaki, and Atsushi Sudo, Annaka, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 5, 1978, Ser. No. 948,761

Claims priority, application Japan, Oct. 31, 1977, 52-129685

Int. Cl.³ B01J *27/14*

U.S. Cl. 252—435 **3 Claims**

1. A catalyst having a heteropoly-acid structure and the general formula:

$$Mo_aV_bP_cCu_dX_eO_f$$

wherein Mo, V, P, Cu and O represent respectively molybdenum, vanadium, phosphorus, copper and oxygen, X represents one or more elements selected from the group consisting of tin, thorium, germanium, nickel, iron, cobalt, magnesium, zinc, titanium, lead, rhenium, zirconium and chromium and a, b, c, d, e and f represent the atomic ratio of the elements where,

a is 10

b is a number of 3 or less than 3 excluding 0,

c is a number of 0.5 to 3,

d is a number of 3 or less than 3 excluding 0,

e is a number of 3 or less than 3 excluding 0,

f is a number determined depending on the valency and atomic ratio of other elements.

4,273,677

PREPARATION OF THALLIUM PROMOTED $VO(PO_3)_2$ OXIDATION CATALYST

James C. Vartuli, West Chester, Pa., and Lee R. Zehner, Dublin, Ohio, assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 19, 1979, Ser. No. 105,367

Int. Cl.³ B01J *27/14, 31/02*

U.S. Cl. 252—435 **14 Claims**

1. A method for the preparation of a thallium promoted single phase crystalline vanadium(IV)bis(metaphosphate) hydrocarbon oxidation catalyst which comprises the steps of:

forming a slurry of vanadyl sulfate, thallic oxide, acetic anhydride and phosphorus pentoxide with the liberation of exothermic heat;

introducing said slurry into a heating zone and maintaining said zone at a temperature of at least about 325° C. for a period sufficient for the liberation of gases and forming a thallium-vanadium-phosphorus reaction product;

cooling the reaction product and washing with water to essentially remove any soluble residue;

drying the water washed product and calcining in air to obtain a thallium containing single phase crystalline vanadium(IV)bis(metaphosphate) catalyst.

4,273,678

METHOD OF PREPARING AN OXYCHLORINATION CATALYST

Ruth M. Lane, and Martyn H. Stacey, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 878,473, Feb. 16, 1978, abandoned, which is a continuation of Ser. No. 431,323, Dec. 28, 1973, abandoned. This application May 11, 1979, Ser. No. 38,076

Claims priority, application United Kingdom, Jan. 9, 1973, 1118/73

Int. Cl.³ B01J *21/04, 21/10, 23/72*

U.S. Cl. 252—463 **6 Claims**

1. A method of preparing an oxychlorination catalyst which is an intimate mixture of the oxides of magnesium, aluminum and copper obtained by calcining, wherein the proportion of magnesium oxide is in the range 0.25 to 2.0 moles per mole of aluminum oxide (Al_2O_3), said catalyst having a magnesia/alumina spinel structure but not in excess of 40%, said method comprising the steps of precipitating the hydrated oxides of magnesium and aluminum from an aqueous solution of their salts, drying and calcining the hydrated oxides at a temperature in the range 300° C. to 700° C. to form a mixed oxide of magnesium and aluminum, then treating the mixed oxide with a solution of a salt of copper and finally again calcining at a temperature in the range 300° C. to 700° C. to provide the copper oxide.

4,273,679

ALUMINUM ALLOYS HAVING A HIGH REDUCING CAPACITY AND PREPARATION THEREOF

Jenö Ghyczy, , assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

Filed May 31, 1979, Ser. No. 44,034

Claims priority, application Hungary, Jun. 3, 1978, GI 278

Int. Cl.³ B01J *21/04, 23/44, 23/72, 23/74*

U.S. Cl. 252—466 J **20 Claims**

1. A process for the preparation of a discontinuous heterodisperse superficial aluminum alloy having a high reducing capacity which comprises the step of:

superficially activating a granular aluminum alloy having a particle size of 0.1 to 1.5 mm wherein the alloying metal has a normal electrode potential greater than that of aluminum by treatment with an acid or base in the presence of a protic solvent to remove an oxide layer present on the aluminum alloy surface and to form in situ a precipitate of the alloying metal dissolved in the protic solvent.

4,273,680

SUPPORTED NON-FERROUS GROUP VIII ALUMINATE COPRECIPITATED HYDROGENATION CATALYSTS AND PROCESS FOR THEIR PREPARATION

Albert P. Halluin, and Allan E. Barnett, both of Westfield, N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Nov. 6, 1979, Ser. No. 91,835

Int. Cl.³ B01J *21/04, 21/08, 21/12, 23/74*

U.S. Cl. 252—466 J **22 Claims**

1. A supported coprecipitated catalyst consisting essentially of one or more metals selected from the non-ferrous metals of Group VIII of the Periodic Table of the Elements, aluminum and solid porous particles, said catalyst being characterized as having a B.E.T. total surface area ranging from about 150 to about 350 m^2/g wherein the total amount of metal in the catalyst ranges from about 25 wt. % to about 70 wt. % based on the total weight of the catalyst after calcination and reduction, and wherein said catalyst has been prepared by coprecipitating aluminum ions and ions of said one or more metals, with the solid porous particles.

4,273,681

SUPPORT MATRIX FOR A CATALYTIC REACTOR FOR SCRUBBING EXHAUST GASES IN AN INTERNAL COMBUSTION ENGINE

Manfred Nonnenmann, Schwieberdingen, Fed. Rep. of Germany, assignor to Süddeutsche Kühlerfabrik Julius Fr. Behr GmbH & Co. KG, Fed. Rep. of Germany

Filed Jan. 17, 1980, Ser. No. 113,136

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1979, 2902779

Int. Cl.³ B01J *23/74, 35/02*

U.S. Cl. 252—472 **17 Claims**

1. A support matrix for a catalytic reactor for scrubbing exhaust gases from internal combustion engines, comprising alternating steel panels coated with catalyst, at least one of said panels being corrugated, and at least one of the steel panels being provided with projections and/or depressions, said de-

pressions being apertures and wherein according to the invention said apertures extend over the entire longitudinal extent of the panel, thereby separating at least one of said panels into narrow strips disposed at a transverse separation from one another.

4,273,682

PRESSURE-SENSITIVE ELECTRICALLY CONDUCTIVE ELASTOMERIC COMPOSITION

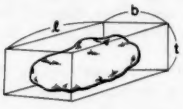
Katsuhiko Kanamori, Hiratsukashi, Japan, assignor to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 862,855, Dec. 12, 1977, abandoned. This application Oct. 10, 1979, Ser. No. 83,367

Claims priority, application Japan, Dec. 24, 1976, 51-155107; Dec. 12, 1977, 52-148045

Int. Cl.³ H01B *1/06*

U.S. Cl. 252—511 **6 Claims**



1. A pressure-sensitive, electrically conductive elastomeric composition consisting essentially of a substrate composed of an organic flexible material and electrically conductive particles incorporated and dispersed therein, wherein said electrically conductive particles are angle-chipped, roundish pebble-like particles of artificial graphite having: (a) a Wadell roundness of at least 0.7; (b) a size passable through a sieve having a mesh size of 180 μm but not passable through a sieve having a mesh size of 40 μm; and (c) a particle size distribution such that the ratio of the size of the minimum particle to the size of the maximum particle is in the range of 1:1 to 1:1.7.

4,273,683

OXIDE CATHODE AND PROCESS FOR PRODUCTION THEREOF

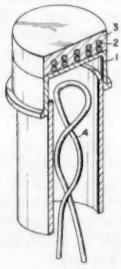
Takao Kawamura, Chiba, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 13, 1978, Ser. No. 969,179

Claims priority, application Japan, Dec. 16, 1977, 52-150545; Dec. 16, 1977, 52-150546

Int. Cl.³ H01B *1/02*

U.S. Cl. 252—513 **13 Claims**



1. In an oxide cathode wherein an oxide layer comprising oxides of alkaline earth metals including Ba is formed on the surface of a base made of an alloy comprising Ni as a main component and at least one reducing element selected from the group consisting of Mg, W, Zr, Si, C and Al, the improvement which comprises 0–40% by mole BaO content in the inner portion of the oxide layer contacting with the base and 40–80% by mole BaO content in the superficial portion of the oxide layer, wherein the content of BaO in said inner portion being 20–80% by mole less than the content of BaO in said superficial portion.

4,273,684

TRANSPARENT DETERGENT BAR

Tetsuya Nagashima, Ogose; Yasunori Usuba, Tokyo; Takahisa Ogawa, Kawagoe, and Masahiro Takehara, Fujisawa, all of Japan, assignors to Ajinomoto Co., Inc. and Kawaken Fine Chemicals Co., Ltd., both of Tokyo, Japan

Filed May 22, 1980, Ser. No. 152,176

Claims priority, application Japan, May 3, 1979, 54-66788; Feb. 13, 1980, 55-15555

Int. Cl.³ C11D *1/10, 3/43, 11/00, 17/00*

U.S. Cl. 252—544 **10 Claims**

1. A transparent detergent bar possessing good foaming power and detergency in hard water consisting essentially of at least one basic amino acid salt of N-long chain acyl-optically active acidic amino acid prepared by the neutralization reaction of 1 mol of N-long chain acyl-optically active acidic amino acid with 1 to 2 mols to basic amino acid and water, the amount of water being in the range of 5 to 25% by weight of the detergent bar apart from water when the neutralization degree of the basic amino acid salt is 1.0 to 1.5 equivalent and 5 to 35% by weight of the detergent bar apart from water when the neutralization degree is 1.6 to 2.0 equivalent.

5. A transparent detergent bar as set forth in claim **1**, further containing urea, wherein the ratio by weight of the amount of basic amino acid salt of N-long chain acyl-optically active acidic amino acid to the amount of urea is from 95:5 to 50:50.

4,273,685

RUBBER MODIFIED ASPHALT COMPOSITIONS

Alfred Marzocchi; Michael G. Roberts; Charles E. Bolen, and Edward R. Harrington, Jr., all of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 881,108, Feb. 24, 1978, abandoned. This application Jun. 4, 1979, Ser. No. 45,047

Int. Cl.³ C08L *95/00*

U.S. Cl. 260—28.5 R **12 Claims**

1. A chemically-modified asphalt composition comprising an asphalt which has been reacted with (1) a polymerizable vinyl aromatic monomer and (2) a rubbery polymer, the reaction having been carried out at a temperature at which the vinyl aromatic monomer and the rubbery polymer react with the asphalt.

4,273,686

EPOXY BASED SYNTHETIC SOLDER

James S. Noland, New Canaan, Conn., and Miroslav Hajek, Bel Air, Md., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 70,948, Aug. 30, 1979, abandoned. This application May 1, 1980, Ser. No. 145,300

Int. Cl.³ C08G *59/46, 50/60*

U.S. Cl. 260—9 **10 Claims**

1. An epoxy based synthetic solder comprising at least one epoxy resin having a plurality of 1,2-epoxy groups, at least one filler, and an effective curing amount of 1,1'-o-phenylenebis(3,3-dimethylurea) wherein the phenyl moiety is optionally substituted with up to two alkyl (C_{1-3}) groups and dicyandiamide.

4,273,687

PREPARATION OF GUANIDINE PHOSPHATE FOR HARDBOARD FLAME RETARDANT USE

Richard W. Cummins, Cranbury; Robert J. Fuchs, Clark, and James L. Thomas, Hamilton Square, all of N.J., assignors to FMC Corporation, Philadlphia, Pa.

Filed Dec. 14, 1979, Ser. No. 103,689
Int. Cl.[3] C08L *1/00;* C09K *3/28*
U.S. Cl. 260—17.2 22 Claims

1. A process for the manufacture of a guanidine phosphate composition containing monoguanidine phosphate and diguanidine phosphate, said composition being characterized by a weight loss of no more than 1.0% when heated for one hour at 220° C. which comprises reacting about equimolar quantities of phosphoric acid and cyanoguanidine by mixing together the two compounds to form a reaction mixture and heating the reaction mixture with agitation in the presence of a surfactant to a temperature in the range of about 200° C. to about 240° C. for about two hours to about one hour.

15. A flame resistant class II hardboard comprising a uniform mixture of about 100 parts of hardboard chips and from about 20 to 30 parts of a heat stable guanidine phosphate composition containing monoguanidine phosphate and diguanidine phosphate; said guanidine phosphate composition being obtained by heating with agitation for about one to about two hours at a temperature of about 240° C. to about 200° C. a reaction mixture of about equimolar quantities of phosphoric acid and cyanoguanidine in the presence of a surfactant; said uniform mixture being bound together by a thermosetting resin to form the hardboard.

4,273,688

WOOD TEXTURED AQUEOUS LATEX CONTAINING WOOD PARTICLES WITH SORBED ORGANIC SOLVENT

Rita E. Porzel, Lisle, and Cathryn D. Bator, Des Plaines, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 941,184, Sep. 11, 1978, Pat. No. 4,202,804. This application Dec. 3, 1979, Ser. No. 96,020
The portion of the term of this patent subsequent to May 13, 1997, has been disclaimed.
Int. Cl.[3] C08L *97/02;* B29J *5/02*
U.S. Cl. 260—17.4 R 9 Claims

1. A viscosity stable, stainable, wood textured, aqueous latex composition comprising from 5% to 30% of the weight of the composition of wood particles having sorbed therein a water immiscible organic solvent in an amount of at least about 60% of the weight of the wood to provide a free-flowing, solvent-wet powder, an aqueous emulsion of film-forming plasticized resin particles coalescable at room temperature or below; said emulsion constituting about 35% to about 70% by weight of the composition, the proportion of wood particles, the resin solids content of said aqueous emulsion and the plasticization of the resin particles providing a viscous mass, and said organic solvent providing viscosity stability.

4,273,689

FILLED, TWO-PART PLASTIC-PRODUCING SYSTEM

Robert W. Smearing, Ballston Lake, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Jul. 30, 1979, Ser. No. 62,161
Int. Cl.[3] C08L *67/02*
U.S. Cl. 260—22 CB 20 Claims

1. A filled two-part plastic-producing system comprising:

(i) (a) unsaturated polyester resin which is at least 30% by weight fumarate polyester, and (b) vinyl monomer and (c) up to 30% by total weight of alcohol, said vinyl monomer present in an amount of from 5% to 20% in excess of that required for curing said resin; and

(ii) a curing agent paste of benzoyl peroxide in a liquid carrier, said curing agent paste containing between 0.2% and 5% by total weight of stearate salt, at least one of components (i) and (ii) additionally containing an essentially inert filler.

4,273,690

COATING COMPOSITIONS OF AN ALKYD-ACRYLIC GRAFT COPOLYMER

Aloysius N. Walus, Troy, Mich., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 9, 1979, Ser. No. 82,554
Int. Cl.[3] C09D *3/66, 3/68*
U.S. Cl. 260—22 CB 28 Claims

1. A coating composition comprising a liquid diluent and about 10–70% by weight, based on the weight of the coating composition, of a binder in which the binder comprises a graft copolymer having an acrylic backbone which comprises about 25–90% by weight, of the graft copolymer and alkyd resin side chains which comprise about 10–75% by weight of the graft copolymer; wherein

the backbone of the graft copolymer comprises polymerized ethylenically unsaturated acrylic monomers and about 0.1–20% by weight, based on the weight of the copolymer, of polymerized isocyanato alkyl acrylate or isocyanato alkyl methacrylate and

the alkyd resin side chains being attached to the acrylic backbone by an isocyanato group wherein the isocyanato group being reacted with a hydroxyl or carboxyl group of the alkyd resin.

4,273,691

FLAME RETARDANT COMPOSITIONS AND COATED ARTICLE

Michael R. MacLaury, Rexford, and Fred F. Holub, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 18, 1979, Ser. No. 85,900
Int. Cl.[3] B32B *25/20;* C08L *83/04;* D02G *3/00*
U.S. Cl. 260—23 S 15 Claims

1. Flame retardant compositions comprising by weight

(A) 70 to 98% of polyolefin,

(B) 1 to 10% of silicone, and

(C) 1 to 20% of Group IIa metal $C_{(6\text{-}20)}$ carboxylic acid salt.

12. An electrical conductor comprising a metallic conductive element insulated with a composition comprising polyolefin, a silicone and a Group IIa metal $C_{(6\text{-}20)}$ carboxylic acid salt in the following proportions by weight

(D) 70% to 98% of polyolefin

(E) 1 to 10% of silicone and

(F) 1 to 20% of Group IIa metal $C_{(6\text{-}20)}$ carboxylic acid salt.

4,273,692

POLYCARBONATE COMPOSITION CONTAINING HALOGEN-FREE ORGANOTIN PLASTICIZER

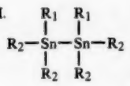
Victor Mark, Evansville, Ind., and Phillip S. Wilson, Louisville, Ky., assignors to General Electric Company, Pittsfield, Mass.

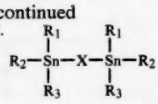
Continuation-in-part of Ser. No. 946,538, Sep. 28, 1978, abandoned. This application Dec. 31, 1979, Ser. No. 108,512
Int. Cl.[3] C08J *3/18;* C08K *3/34*
U.S. Cl. 260—29.1 R 7 Claims

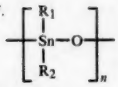
1. A halogen-free plasticized polycarbonate composition comprising an admixture of a high molecular weight aromatic polycarbonate and a plasticizing amount of a halogen-free organotin plasticizer represented by the following general formulae:

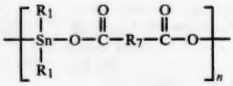
I. $R_1-\underset{\displaystyle R_4}{\overset{\displaystyle R_2}{\underset{|}{\overset{|}{Sn}}}}-R_3$ II. R_5-Sn-R_6

-continued

III. 

IV. 

V. 

IV. 

wherein R_1 and R_2 can independently be C_1 to C_{20} alkyl, cycloalkyl of 4 to 14 carbon atoms, alkenyl of 2 to 20 carbon atoms, aryl, and substituted aryl of 6 to 14 carbon atoms wherein the substituents on said substituted aryl can be alkoxy of 1 to 20 carbon atoms, alkaryl of 7 to 36 carbon atoms, and aralkyl of 7 to 36 carbon atoms; R_3 and R_4 can independently be C_1 to C_{20} alkyl, cycloalkyl of 4 to 14 carbon atoms, alkoxy of 1 to 20 carbon atoms, cycloalkoxy of 4 to 14 carbon atoms, aryloxy, and substituted aryloxy of 6 to 14 carbon atoms wherein the substituents on said substituted aryloxy can be alkyl of 1 to 20 carbon atoms, acyloxy of 1 to 30 carbon atoms including aliphatic, cycloaliphatic, aromatic and substituted aromatic radicals wherein the substituents on said substituted aromatic radicals can be alkyl of 1 to 20 carbon atoms; R_5 and R_6 can independently be acyloxy radicals of 1 to 30 carbon atoms including aliphatic, cycloaliphatic, aromatic and substituted aromatic radicals wherein the substituents on said substituted aromatic radicals can be alkyl of 1 to 20 carbon atoms; R_7 is a divalent organic radical of 1 to 20 carbon atoms selected from the group consisting of alkylene, cycloalkylene, alkenylene, arylene, alkylidene and cycloalkylidene radicals; X is a divalent oxygen radical; and, n is an integer of 1 to 20.

4,273,693

PREPARATION OF FURAN POLYMERS

Young D. Kim, Columbus, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Mar. 19, 1980, Ser. No. 131,562
Int. Cl.³ C08J 3/00; C08L 61/00
U.S. Cl. 260—29.2 N **28 Claims**

1. A process for preparing a water-compatible nitrogen-containing furan polymer which comprises:

providing a composition containing at least one saturated aliphatic monohydric alcohol having 1–3 carbon atoms, water, furfuryl alcohol, and aldehyde;

subjecting the composition to condensation reaction at an acidic pH in the presence of an acidic catalyst until the free aldehyde content is about 18 to about 22% by weight;

adding a nitrogen-containing compound containing at least one

when said free aldehyde content is about 18 to about 22% by weight; and

then continuing the condensation reaction at an acidic pH for a time sufficient to provide a polymer composition having a viscosity of about 0.5 to bout 7 strokes at 25° C., and thereby obtaining said water-compatible furan polymer.

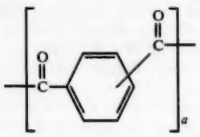
4,273,694

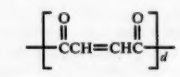
CERTAIN ACID SALTS OF POLYESTER AMINOORGANOSILANES

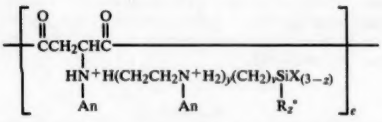
Enrico J. Pepe, and James G. Marsden, both of Amawalk, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Apr. 1, 1980, Ser. No. 136,362
Int. Cl.³ C08J 3/00; C08G 77/26
U.S. Cl. 260—29.2 E **6 Claims**

1. A polyester polymer product having a molecular weight of greater than 1000 and comprising units of the formulae







wherein R is a divalent hydrocarbon radical, R^o is a monovalent alkyl, aryl, or aralkyl group, X is a monovalent alkoxy, hydroxy, or oxy- group, y is 0 or 1, v is an integer of from 1 to 6, z is 2, 1, or 0, a is 0 or a mole fraction of from 0.004 to 0.6, b and e are mole fractions ranging from about 0.004 to about 0.6, and d is a mole fraction ranging from about 0.4 to about 0.6, with the proviso that d is greater than, equal to, or slightly less than the sum of a, b, and e, and An is the anion of a strong monovalent mineral acid which has a pKa of less than −3.

4,273,695

ETHYLENE-ACRYLIC ENAMELS

Robin N. Greene, Wilmington, Del., and Walter R. Hertler, Kennett Square, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 20, 1979, Ser. No. 105,642
Int. Cl.³ C08L 61/28
U.S. Cl. 260—29.4 UA **14 Claims**

1. Curable coating composition containing the film-forming ingredient consisting essentially of, with the sums of the parts by weight and the mole percentages being 100 and 100%, respectively:

(1) about 55–95 parts by weight of a copolymer of

(a) 20–70 mole % ethylene,

(b) 20–60 mole % methyl methacrylate,

(c) 1–15 mole % of a hydroxyalkyl ester of acrylic acid or methacrylic acid in which the hydroxyalkyl group contains 2–4 carbon atoms, and

(d) 0–9 mole % of an α,β-unsaturated carboxylic acid selected from acrylic acid, methacrylic acid, itaconic acid, crotonic acid, 2-ethylacrylic acid, and 2-propylacrylic acid, or of maleic anhydride, and

(2) about 5–45 parts by weight of a nitrogen-resin crosslinking agent.

4,273,696
POLYVINYLCHLORIDE COMPOSITIONS CONTAINING PHENOXY ALKANOL DICARBOXYLIC ACID ESTER PLASTICIZERS

Dennis Marshall, and Harry C. Murfitt, both of Wilton, England, assignors to Imperial Chemical Industries Limited, London, England

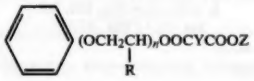
Filed Nov. 27, 1978, Ser. No. 963,885

Claims priority, application United Kingdom, Nov. 30, 1977, 49838/77

Int. Cl.³ C08K *5/10;* **C07C** *69/40, 69/42, 69/44*

U.S. Cl. 260—31.4 R **6 Claims**

1. A polyvinyl chloride composition which is plasticized with a compound of formula:



in which

Y is a phenylene or $(CH_2)_m$ group in which m is an integer having a value of 1 to 8,

Z is an alkyl group having 4 to 13 carbon atoms,

n is an integer in the range of 1 to 5, and

R represents either a hydrogen atom or a methyl group.

4,273,697
ELECTRICALLY CONDUCTIVE CURABLE LIQUID ORGANOPOLYSILOXANE COMPOSITIONS

Shinichi Sumimura, and Koji Shimuzu, both of Ichihara, Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Feb. 19, 1980, Ser. No. 122,782

Claims priority, application Japan, Mar. 9, 1979, 54-26760

Int. Cl.³ C08L *83/04*

U.S. Cl. 260—37 SB **10 Claims**

1. A curable liquid composition comprising (A) 100 parts by weight of a curable liquid organopolysiloxane comprising a liquid polyorganosiloxane and a cross-linking agent and (B) 0.1 to 70 parts by weight of carbon black whose specific surface area is at least 900 m^2/g and which are hollow-shell-shaped particles.

4,273,698
SELF-BONDING ROOM TEMPERATURE VULCANIZABLE SILICONE RUBBER COMPOSITIONS

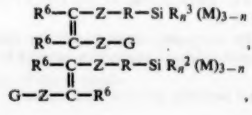
Alfred H. Smith, Jr., Ballston Lake; George P. De Zuba, Mechanicville, and Tyrone D. Mitchell, Colonie, all of N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed Feb. 28, 1979, Ser. No. 16,254

Int. Cl.³ C08L *83/06*

U.S. Cl. 260—37 SB **30 Claims**

1. A self-bonding room temperature vulcanizable silicone rubber composition comprising (a) 100 parts by weight of a silanol-terminated diorganopolysiloxane having a viscosity varying from 300 to 10,000,000 centipoise at 25° C. where the organo is a monovalent hydrocarbon radical; (b) from 5 to 200 parts by weight of a filler; (c) from 2 to 10 parts by weight of a crosslinking agent selected from the class consisting of carboxylic functional silanes and hydrocarbonoxy functional silanes; (d) from 0.01 to 5 parts by weight of a curing catalyst selected from the class consisting of carboxylic acid salts and titanates; and (e) from 0.1 to 3 parts by weight of a self-bonding additive selected from the groups consisting of



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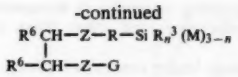
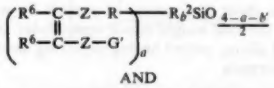


where Z is selected from

phenylene,

CONH and $CONR_2^2$ G is selected from the class consisting of hydrogen, R', R^4 Si R_n^2 $(M)_{3-n}$ where R' is selected from monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals, R and R^4 is a divalent hydrocarbon radical, R^2 is selected from monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals, M is selected from R^3O and R^3

radicals R^3 is selected from monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals, R^6 is selected from hydrogen, and alkyl radicals of up to 10 carbon atoms, and n is a whole number that varies from 1 to 3, and self-bonding polysiloxane additives selected from the group consisting of the formulas,



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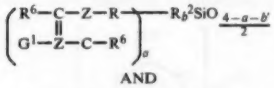

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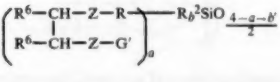


where G' is selected from the class consisting of hydrogen, R' and

and where Z, R', R^4, R^2, R^6 and R are as previously defined, a varies from 0.005 to 2.0, b' varies from 1.0 to 2.5 the sum of a+b varies from 1.005 to 3.0, c varies from 0 to 1.0, d varies from 1.0 to 2.5 and the sum of c+d varies from 1.0 to 2.0.

4,273,699
FRICTION MATERIALS

John Chester, Stockport, England, assignor to Ferodo Limited, Manchester, England

Filed Jul. 31, 1978, Ser. No. 929,535

Claims priority, application United Kingdom, Aug. 10, 1977, 33458/77

Int. Cl.³ C08K *3/10, 7/14, 7/04*

U.S. Cl. 260—38 **4 Claims**

1. An asbestos-free friction material composition for molded

friction pads consisting essentially of thermosetting binder, a fiber-based reinforcement and other fillers and additives, wherein

(a) the thermoset binder comprises a phenol-formaldehyde resin,

(b) the thermoset binder constitutes 20% to 60% by volume of the composition of which at least half is said phenol formaldehyde resin,

(c) the fiber-based reinforcement consists essentially of a mixture of staple steel fibers and short lengths of milled glass fiber,

(d) the fiber-based reinforcement constitutes 10% to 35% by volume of the composition, and

(e) the balance of the composition consists essentially of inorganic friction and wear modifiers and particulate inorganic fillers.

4,273,700

POLYOL RESIN BINDER COMPOSITIONS AND PROCESS

Khe-Bing J. Kho, New City, N.Y., assignor to Reichhold Chemicals, Incorporated, White Plains, N.Y.

Filed Oct. 17, 1979, Ser. No. 85,528

Int. Cl.³ C08K *3/36*

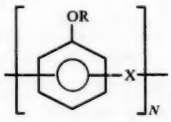
U.S. Cl. 260—38 **28 Claims**

1. A process for preparing self-curing coated aggregate product comprising mixing together to form a homogeneous admixture

(I) a foundry aggregate containing sand as its major component

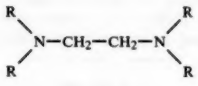
(II) from about 0.1 percent to about 10 percent by weight, based upon the weight of the aggregate used, of a resin binder composition containing an admixture of polyhydroxy polyols with a substantial portion of the polyols containing ether linkages, said polyhydroxy polyols comprising a mixture of

(a) from about 90 to about 15 percent by weight, based upon the total weight of said resin binder, of a phenolic-based alkoxy polyol having repeating units of the general formula

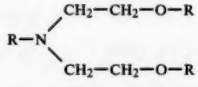


wherein X is CH_2 or H and the CH_2 group may be in the ortho, meta or para position or mixtures thereof, N is an integer greater than one, and R represents an aliphatic carbinol radical having from 2 to 4 carbon atoms; and

(b) from about 10 to about 85 percent by weight, based upon the total weight of said resin binder, of an admixture of a tertiary hydroxy diamine polyol of the general formula



and a tertiary alkoxy hydroxy amine polyol of the general formula



wherein R represents an aliphatic carbinol radical having 2 to 4 carbon atoms, and

(III) from about 40 percent to about 60 percent of a polyisocyanate based upon the total weight of component (II), whereby said admixture of said resin binder composition reacts with said polyisocyanate to form on said foundry aggregate a self-curing polyurethane coating.

4,273,701

COLORANT-THICKENER DISPERSIONS FOR UNSATURATED POLYESTER RESIN COMPOSITIONS

Martin L. Feldman, East Brunswick, and James T. De Groff, Oldwick, both of N.J., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Division of Ser. No. 44,724, Jun. 1, 1979. This application Feb. 8, 1980, Ser. No. 119,718

Int. Cl.³ C08L *67/00*

U.S. Cl. 260—40 R **9 Claims**

1. An unsaturated polyester resin composition that comprises

(a) an unsaturated polyester resin formed by condensing a saturated dicarboxylic acid and an unsaturated dicarboxylic acid with a dihydric alcohol,

(b) an unsaturated monomer capable of reacting with the unsaturated polyester to form cross-linkages, and

(c) a colorant-thickener dispersion that comprises

(1) 20% to 50% by weight of a thickener comprising a Group II-A metal oxide or hydroxide,

(2) 5% to 20% by weight of a pigment component, and

(3) 30% to 75% by weight of an unsaturated polyester vehicle that comprises

((a)) 80% to 98% by weight of an unsaturated polyester that is the product of the reaction of a dicarboxylic acid component containing 80 to 90 mole % of at least one unsaturated aliphatic dicarboxylic acid having 4 to 8 carbon atoms and 10 to 20 mole % of at least one saturated aromatic dicarboxylic acid with an alcohol component containing 40 to 60 mole % of at least one glycol having 2 to 6 carbon atoms and 40 to 60 mole % of at least one monohydric alcohol having 6 to 12 carbon atoms, in the amount of 0.4 mole to 0.6 mole of the dicarboxylic acid component per mole of the alcohol component, and

((b)) 2% to 20% by weight of an unsaturated monomer capable of reacting with said unsaturated polyester to form cross-linkages.

4,273,702

COBALT ALUMINATE INTERNAL COLORANTS FOR DIOL BIS (ALLYL CARBONATE)

Ivan R. Leatherman, Wadsworth, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 4, 1980, Ser. No. 118,290

Int. Cl.³ C08K *8/22*

U.S. Cl. 260—42.53 **12 Claims**

1. A liquid composition comprising diol bis (allyl carbonate) monomer and $CoAl_2O_4$.

4,273,703

INTERFERON PRODUCT AND PROCESS FOR ITS PREPARATION

Kurt B. Osther, Naerum, and Werner K. Jensen, Roskilde, both of Denmark, assignors to Ess-Food Eksport-Svineslagteriernes Salgsforening, Copenhagen, Denmark

Filed Oct. 27, 1978, Ser. No. 955,389

Claims priority, application Denmark, Nov. 1, 1977, 4859/77

Int. Cl.³ A61K *45/02, 37/00;* **C07G** *7/00*

U.S. Cl. 260—112 R **4 Claims**

1. A process for preparing exogenic porcine leucocyte interferon which shows antiviral protective activity in human cells comprising:

harvesting and isolating porcine leucocytes:

treating said porcine leucocytes with an interferon inductor;
incubating said treated porcine leucocytes;
adding a protein source which in immunoelectrophoreses is substantially composed of bands which are identical or partially identical with corresponding bands in human agammaserum when using, as precipitating antibody, antitotal human serum protein, antihuman IgG, antihuman IgA, antihuman IgM or antihuman albumin.

4,273,704

N-ADAMANTANE-SUBSTITUTED TETRAPEPTIDE AMIDES

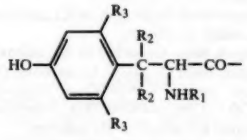
Robert H. Mazur, Deerfield, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Filed Dec. 3, 1979, Ser. No. 99,765
Int. Cl.³ C07C *103/52*
U.S. Cl. 260—112.5 R **17 Claims**

1. A compound of the formula

W—X—Gly—Y—Z

wherein W represents tyrosine or a radical of the formula

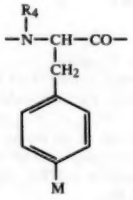


wherein

R_1, R_2, and R_3 may each independently be hydrogen or an alkyl group having 1 to 4 atoms;

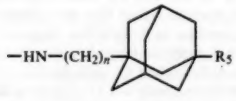
X represents methionine, methionine sulfoxide, dehydro-α-aminobutyric acid, 1-aminocyclopropane carboxylic acid, alanine, O-methylhomoserine, proline or norleucine;

Y represents phenylalanine, dehydrophenylalanine, cyclohexylalanine, or a radical of the formula

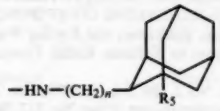


wherein R_4 represents hydrogen or an alkyl group having 1 to 4 carbon atoms, and M represents hydrogen, nitro or halogen;

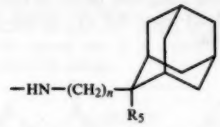
Z represents a radical of the formula



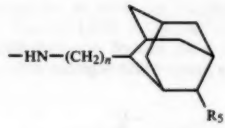
wherein R_5 represents hydrogen, carboxyl, methoxycarbonyl, carboxamide, or hydroxymethyl, and n is 0, 1, or 2; a radical of the formula



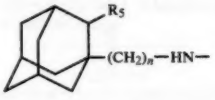
wherein R_5 and n are defined as hereinbefore; a radical of the formula



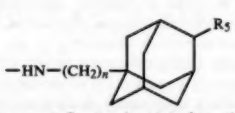
wherein R_5 and n are defined as hereinbefore; a radical of the formula



wherein R_5 and n are defined as hereinbefore; a radical of the formula



wherein R_5 and n are defined as hereinbefore; or a radical of the formula



wherein R_5 and n are defined as hereinbefore; the stereochemical configuration of each of the optically active amino acid residues may independently be D, L or DL; and the pharmacologically acceptable salts thereof.

4,273,705

METHOD FOR PREPARING COLLAGEN FILAMENTS FOR USE IN MEDICAL TREATMENTS

Tadaaki Kato, Tokyo, Japan, assignor to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 5, 1979, Ser. No. 91,343
Claims priority, application Japan, Oct. 4, 1979, 54-128158
Int. Cl.³ C07G *7/00;* **C08H** *1/06;* **C08L** *89/06*
U.S. Cl. 260—123.7 **3 Claims**

1. A method for preparation of collagen filaments for use in medical treatments comprising the steps of dispersing in an aqueous acidic solution a finely shredded insoluble collagen material, from which impurities have been removed without use of enzymes, alkali or heavy metals, and of subjecting the thus dispersed collagen material to irradiation of ultrasonic waves.

4,273,706

NONDIFFUSIBLE HETEROCYCLYLAZONAPHTHOL DYE-RELEASING COMPOUNDS

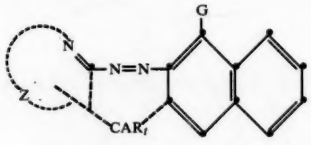
Derek D. Chapman, Rochester, and E-ming Wu, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 2,126, Jan. 9, 1979, Pat. No. 4,204,870, which is a continuation-in-part of Ser. No. 927,785, Jul. 25, 1978, abandoned, Division of Ser. No. 832,309, Sep. 12, 1977, abandoned. This application Sep. 14, 1979, Ser. No. 75,443

Int. Cl.[3] **C09B** *29/033, 29/036, 29/039, 29/15*

U.S. Cl. 260—156 **15 Claims**

1. A nondiffusible compound having at least one releasable 2-(2-heterocyclylazo)-1-naphthol dye moiety, said compound having the formula:



wherein:

G is hydroxy, a salt thereof, or a hydrolyzable precursor thereof; or a group which together with

is CAR, said CAR being bonded to the naphthalene group through the oxygen of said

group;

Z represents the atoms necessary to complete a heterocyclyl moiety not being substituted with a nitro group, said heterocyclyl moiety being selected from the group consisting of pyridine, pyrimidine, quinoline, isoquinoline, pyrazine, pyridazine, thiazole, thiadiazole, triazole, benzothiazole and acinaphthothiazole;

CAR represents a ballasted carrier moiety which will release said dye moiety as a function of development of a silver halide emulsion layer under alkaline conditions; and

t is a positive integer of 1 to 2.

4,273,707

MONOAZO AND DISAZO DYES CONTAINING AT LEAST ONE SULFO GROUP AND AT LEAST TWO BASIC OR CATIONIC GROUPS

Reinhard Pedrazzi, Allschwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

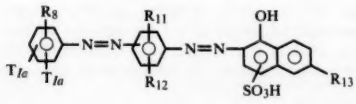
Filed Apr. 20, 1979, Ser. No. 31,781

Claims priority, application Switzerland, Apr. 26, 1978, 4500/78; Apr. 26, 1978, 4501/78

Int. Cl.[3] **C09B** *31/02, 29/22*

U.S. Cl. 260—187 **34 Claims**

1. A compound of the formula

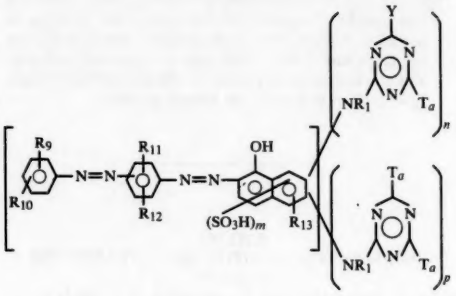


(a)

or

-continued

(b)



or an external salt thereof,

wherein each

R_1 is independently hydrogen or C_{1-4}alkyl,

R_8 is hydrogen, C_{1-4}alkyl, C_{1-4}alkoxy, halo, C_{1-4}alkylamino, di-(C_{1-4}alkyl)amino, $-SO_2NR_1R_1$ or $-CONR_1R_1$,

wherein each R_1 is independently hydrogen or C_{1-4}alkyl,

R_9 is hydrogen, halo, C_{1-4}alkyl, C_{1-4}alkoxy, phenoxy, $-NHCOR_{14}$, $-SO_2R_{14}$, $-SO_2NR_1R_1$ or $-CONR_1R_1$, wherein each

R_1 is independently hydrogen or C_{1-4}alkyl, and

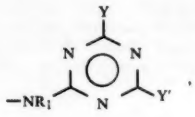
R_{14} is C_{1-4}alkyl or phenyl,

R_{10} is hydrogen, halo, C_{1-4}alkyl or C_{1-4}alkoxy,

R_{11} is hydrogen, halo, C_{1-4}alkyl, C_{1-4}alkoxy, (C_{1-4}alkyl)carbonylamino, ureido, $-NHCO-(CH_2)_k-N(C_{1-4}alkyl)_2$ or $-NHCO-(CH_2)_k-N^{\oplus}(CH_3)_3$, wherein k is 1, 2 or 3,

R_{12} is hydrogen, C_{1-4}alkyl or C_{1-4}alkoxy,

R_{13} is hydrogen; amino; (C_{1-4}alkyl)carbonylamino; benzamido; substituted benzamido having, on the phenyl ring, 1 or 2 substituents selected from halo, nitro, amino, C_{1-4}alkyl and C_{1-4}alkoxy; or



wherein

R_1 is hydrogen or C_{1-4}alkyl,

Y is chloro, hydroxy, amino or an amino group having at least one aliphatic, cycloaliphatic or aromatic substituent, and

Y′ is hydroxy, amino or an an amino group having at least one aliphatic, cycloaliphatic or aromatic substituent,

each T_a is independently $-NR_2'-Q-NR_3'R_4'$ or $-NR_2'-Q-N^{\oplus}R_5'R_6'R_7'$,

wherein

R_2' is hydrogen or methyl,

each of R_3' and R_4' is independently hydrogen, C_{1-6}alkyl, n-C_{2-3}-hydroxyalkyl or benzyl,

each of R_5' and R_6' is independently C_{1-6}alkyl, n-C_{2-3}-hydroxyalkyl or benzyl or

R_3' and R_4' or R_5' and R_6' taken together and with the nitrogen atom to which they are joined form a pyrrolidine, piperidine or morpholine ring,

R_7' is methyl, ethyl or benzyl, and

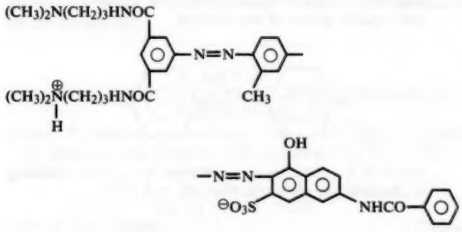
Q is linear or branched C_{2-6}alkylene,

each T_{Ia} is independently $-CO-T_a$ or $-SO_2-T_a$, wherein T_a is as defined above,

each Y is independently chloro, hydroxy, amino or an amino group having at least one aliphatic cycloaliphatic or aromatic substituent,

m is 1 or 2,
n is 0, 1, 2, 3 or 4, and
p is 0, 1, 2 or 3,
with the proviso that $n+2p \geqq m+1$,
with the provisos that (i) the two —N=N— radicals in (a) are meta or para to each other, (ii) the two —N=N— radicals in (b) are meta or para to each other, (iii) each basic group is independently in free base, internal salt or acid addition salt form, (iv) the positive charge of each cationic group is independently balanced by the negative charge of a $-SO_3^{\ominus}$ group of the molecule or an external non-chromophoric anion, and (v) the number of basic groups in internal salt form and cationic groups the positive charge of which is balanced by the negative charge of a $-SO_3^{\ominus}$ group of the molecule does not exceed the number of sulfo groups present in the molecule.

10. The compound according to claim **9** having the formula



4,273,708

CARBONYL-SUBSTITUTED CYAN AZO DYE-PROVIDING MATERIALS

Kenneth N. Kilminster, Leighton-Linslade, and Colin Holstead, Abbots Langley, both of England, assignors to Eastman Kodak Company, Rochester, N.Y.

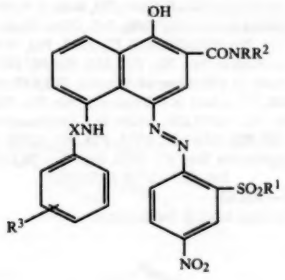
Division of Ser. No. 934,454, Aug. 17, 1978, Pat. No. 4,195,993. This application Jun. 6, 1979, Ser. No. 46,137

Claims priority, application United Kingdom, Dec. 12, 1977, 51648/77

Int. Cl.[3] **C07C** *107/04;* **C09B** *29/20, 29/22, 29/36*

U.S. Cl. 260—199 **9 Claims**

1. A nondiffusible compound which releases a cyan dye, said compound having a formula as follows:



wherein:

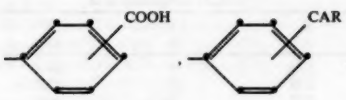
R^1 is selected from the group consisting of aryl, alkyl and $NR^{11}R^{12}$ wherein R^{11} is alkyl or aryl and R^{12} is alkyl, or R^{11} and R^{12}, taken together with the nitrogen atom to which they are attached, is a heterocyclic group;

X is —CO— or $-SO_2-$;

R^3 is —COOH or —CAR and is attached in the meta or para position to X in the benzene ring;

R is alkyl;

R^2 is



or taken together with R and the nitrogen atom to which it is attached form a heterocyclic ring, unsubstituted or substituted with a carboxy group; and

CAR is a ballasted carrier moiety which, as a function of oxidation under alkaline conditions, releases said cyan dye, with the proviso that the compound must contain at least one CAR moiety and, except when R and R^2 form a heterocyclic group and X is $-SO_3-$, must contain at least one carboxy group.

4,273,709

PROCESS FOR THE PREPARATION OF THIENAMYCIN AND INTERMEDIATES

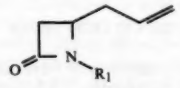
Burton G. Christensen, Scotch Plains; Ronald W. Ratcliffe, Matawan, and Thomas N. Salzmann, North Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jul. 23, 1979, Ser. No. 59,842

Int. Cl.[3] **C07D** *205/08, 487/04*

U.S. Cl. 260—239 A **4 Claims**

1. The compound of the formula



wherein R^1 is triloweralkylsilyl, wherein the alkyl moieties have from 1 to 6 carbon atoms.

4,273,710

PROCESS FOR PREPARING FLUNISOLIDE

Richard E. Jones, Palo Alto, Calif., and Jacquelyn A. Smithers, Concepcion, Chile, assignors to Syntex Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 40,830, May 21, 1979, abandoned. This application May 16, 1980, Ser. No. 150,400

Int. Cl.[3] **C07J** *71/00*

U.S. Cl. 260—239.55 D **6 Claims**

1. A process for preparing a crystalline form of flunisolide which contains 2.0±0.2% by weight water exhibits an X-ray diffraction pattern as set forth in Table A.

TABLE A

d A	I/I_1 %	Θ deg.
10.04	50	4.4
9.82	60	4.5
9.30	80	4.8
7.69	50	5.8
6.91	50	6.4
6.32	10	7.0
5.98	90	7.4
5.53	100	8.0
5.21	60	8.5
5.06	60	8.8
4.79	10	9.3
4.55	70	9.8
4.33	1	10.3
4.13	10	10.8
3.95	10	11.3
3.86	5b	11.5
3.70	5	12.0
3.63	10	12.3
3.36	1	13.3
3.30	2	13.5
3.21	2	13.9

TABLE A-continued

d A	I/I1 %	Θ deg.
3.03	1	14.8
2.88	2	15.5
2.67	2b	16.8
2.63	1	17.0
2.60	1	17.3
2.56	1	17.5
2.40	3	18.8
2.31	1	19.5
2.28	1	19.8
2.13	1	21.3
2.10	1	21.5
1.97	1	23.0
1.88	2	24.3

which process comprises crystallizing said steroid from a solution of said steroid in a liquid alkanol of three or four carbon atoms containing 0.2 to 5% water by volume.

4,273,711

PROCESS FOR THE PREPARATION OF 4-HYDROXYCARBAZOLE

Karl Lauer, Schriesheim, and Einhart Kiegel, Mannheim, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Jun. 26, 1980, Ser. No. 163,253

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1979, 2928483

Int. Cl.³ C07D *209/88*

U.S. Cl. 260—315 **7 Claims**

1. Process for the preparation of 4-hydroxycarbazole which process comprises dehydrating 1,2,3,4-tetrahydro-4-oxocarbazole in aqueous alkaline solution using a Raney nickel catalyst.

4,273,712

METHOD FOR MAKING AROMATIC ETHER IMIDES

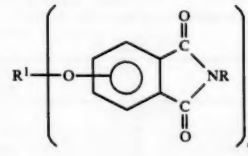
Frank J. Williams, III, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 9, 1979, Ser. No. 37,441

Int. Cl.³ C07D *209/48*

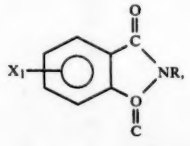
U.S. Cl. 260—326 N **15 Claims**

1. A method for making aromatic ether imides of the formula,



which comprises

(A) heating at 25° to 150° C. under substantially anhydrous conditions, a mixture consisting essentially of substituted phthalimide of the formula,



and an alkali metal phenoxide salt of the formula,

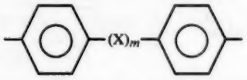
$R^1—OM)_a$,

in the presence of a nonpolar organic solvent and an effective amount of a phase transfer catalyst of the formula,

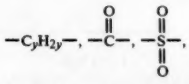
$(R^2)_4QY$,

(B) agitating the resulting mixture with a precipitating or extractive organic solvent for the resulting bisimide or allowing the mixture to cool and

(C) recovering the bisimide from the mixture of (B), where R is a monovalent group selected from hydrogen, a $C_{(1-8)}$ alkyl group, a $C_{(6-13)}$ aryl group and a and a $C_{(6-13)}$ haloaryl group, R^1 is an aromatic group selected from the group consisting of a $C_{(6-30)}$ aromatic carbocyclic group, a halogenated $C_{(6-30)}$ aromatic carbocyclic group and an alkylated $C_{(6-30)}$ aromatic carbocyclic group and a divalent organic group of the formula,



where X is a member selected from the group consisting of divalent groups of the formula,



—O—, and —S—, m is 0 or 1, y is a whole number from 1 to 5, R^2 is selected from a $C_{(1-16)}$ alkyl radical and a $C_{(6-13)}$ aromatic carbocyclic radical, Q is a Group Va element selected from N and P, Y is a halogen or carbethoxy radical, X_1 is a member selected from the group consisting of nitro and halo, and a is an integer equal to 1 or 2, and when a is 1, R^1 is monovalent and when a is 2, R^1 is divalent.

4,273,713

PHENYL AND LOWER ALKYL SUBSTITUTED PYRROLE-3-ACRYLONITRILES

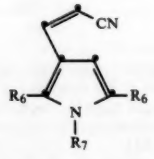
Malcolm R. Bell, and Rudolf Oesterlin, both of East Greenbush, N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 928,456, Jul. 27, 1978, Pat. No. 4,239,697, which is a division of Ser. No. 839,328, Oct. 4, 1977, Pat. No. 4,140,854, which is a division of Ser. No. 703,949, Jul. 9, 1976, Pat. No. 4,098,797, which is a division of Ser. No. 558,807, Mar. 17, 1975, Pat. No. 4,008,250, which is a continuation-in-part of Ser. No. 346,005, Mar. 29, 1973, Pat. No. 3,928,380. This application Sep. 17, 1979, Ser. No. 76,125

Int. Cl.³ C07D *207/337*

U.S. Cl. 260—326.62 **3 Claims**

1. A compound having the formula



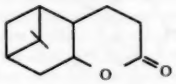
where each R_6 is lower-alkyl; and R_7 is lower-alkyl or phenyl, or phenyl substituted in the phenyl nucleus by a lower-alkyl group.

4,273,714
TRICYCLIC LACTONES

Joseph J. Becker, Geneva, Switzerland, assignor to Firmenich, S.A., Geneva, Switzerland

Filed Apr. 21, 1980, Ser. No. 142,051
Claims priority, application Switzerland, Apr. 27, 1979, 3972/79
Int. Cl.[3] C07D *311/74*
U.S. Cl. 260—343.21 3 Claims

1. A compound of the formula



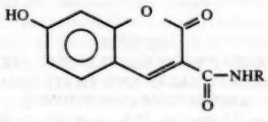
possessing a single or a double bond in the position indicated by the dotted line.

4,273,715
N-(HYDROXYALKYL)-7-HYDROXYCOUMARIN-3-CARBOXAMIDES

Robert T. Buckler, Edwardsburg, Mich., and John F. Burd, Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Apr. 14, 1980, Ser. No. 140,019
Int. Cl.[3] C07D *311.16*
U.S. Cl. 260—343.45 3 Claims

1. A compound of the formula:



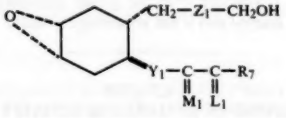
wherein R is hydroxy substituted lower alkyl.

4,273,716
2-DECARBOXY-2-HYDROXYMETHYL-11A-HOMO-TXA$_2$ COMPOUNDS

Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 35,143, May 1, 1979, Pat. No. 4,218,378. This application Jan. 28, 1980, Ser. No. 115,969
Int. Cl.[3] C07D *309/06*
U.S. Cl. 260—345.9 P 2 Claims

1. A thromboxane analog of formula IV



wherein Y_1 is
(1) trans-CH=CH—,
(2) cis—CH=CH—,
(3) —CH_2CH_2—, or
(4) —C≡C—,
wherein M_1 is α—R_5:β—OH, α—OH:β-R_5, or α—H:β-H, wherein R_5 is hydrogen or methyl, and wherein L_1 is α-R_3:β-R_4, α-R_4:β-R_3, or a mixture of α-R_3:β-R_4 and β-R_3:α-R_4, wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro, or wherein —$C(M_1)$—$C(L_1)$— is trans—CH=CH—;

wherein Z_1 is
(1) cis-13 CH=CH—CH_2—$(CH_2)_g$—CH_2—,
(2) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—,
(3) cis—CH_2—CH=CH—$(CH_2)_g$—CH_2—,
(4) —$(CH_2)_3$—$(CH_2)_g$—CH_2—,
(5) —$(CH_2)_3$—$(CH_2)_g$—CF_2—,
(6) —CH_2—O—CH_2—$(CH_2)_g$—CH_2—,
(7) —$(CH_2)_2$—O—$(CH_2)_g$—CH_2—, or
(8) trans—CH_2—$(CH_2)_g$—CH_2—CH=CH—;
(9) —(m-Ph)—O—$(CH_2)_g$—, or
(10) —(m-Ph)—CH_2—$(CH_2)_g$—,

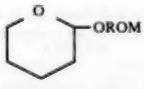
(I) wherein g is one, 2, or 3 and —(m—Ph)— is meta-phenylene; and
wherein R_7 is
(1) —$(CH_2)_m$—CH_3, wherein m is an integer from one to 5, inclusive;
(2) phenoxy;
(3) phenoxy substituted by one, two or three chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two substituents are other than alkyl;
(4) phenyl;
(5) phenyl substituted by one, two or three chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two substituents are other than alkyl;
(6) phenylmethyl, phenylethyl, or phenylpropyl; or
(7) phenylmethyl, phenylethyl, or phenylpropyl substituted by one, two or three chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two substituents are other than alkyl; with the proviso that R_7 is phenoxy or substituted phenoxy, only when R_3 and R_4 are hydrogen or methyl, being the same or different.

4,273,717
MONOCAPPED BISPHENOL SALTS AND METHOD OF MAKING

James C. Carnahan, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 942,957, Sep. 18, 1978, abandoned. This application Dec. 17, 1979, Ser. No. 104,424
Int. Cl.[3] C07D *309/22*
U.S. Cl. 260—345.9 R 5 Claims

1. Monocapped bisphenol salts of the formula,



where R is a $C_{(6-30)}$ divalent organic radical selected from the class consisting of $C_{(6-13)}$ divalent aromatic hydrocarbon radicals and halogenated derivatives thereof and divalent organic radicals of the formula,

$$-R^1-Q-Rhu\ 1-,$$

where R^1 is selected from divalent $C_{(6-13)}$ aromatic hydrocarbon radicals and halogenated derivatives thereof and Q is selected from —O—, —S—, —Si—,

fluorenyl, cyclohexyl, and $-C_yH_{2y}-$, where y is an integer having a value of from 1–5 inclusive.

4,273,718

2-DECARBOXY-2-HYDROXYMETHYL-9-DEOXY-6ε,9α-EPOXY-16,16-DIFLUORO-19-HYDROXY-PGF$_1$

John C. Sih, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 054,811, Jul. 5, 1979, Pat. No. 4,225,508. This application Mar. 3, 1980, Ser. No. 126,483

Int. Cl.^{3} C07D *307/935*

U.S. Cl. 260—346.22 **1 Claim**

1. 2-Decarboxy-2-hydroxymethyl-9-deoxy-6ξ,9α-epoxy-16,16-difluoro-19-hydroxy-PGF$_1$.

4,273,719

PROCESS FOR PREPARING 3,4,5,6-TETRAHYDROPHTHALIC ANHYDRIDES OR DERIVATIVES THEREOF

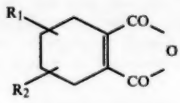
Shoji Tani, and Kenji Nishio, both of Kyoto, Japan, assignors to New Japan Chemical Company, Ltd., Japan

Filed Nov. 21, 1979, Ser. No. 96,373

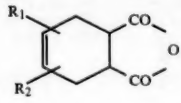
Int. Cl.^{3} C07D *307/89*

U.S. Cl. 260—346.3 **7 Claims**

1. A process for preparing a 3,4,5,6-tetrahydrophthalic anhydride or a derivative thereof represented by the formula



wherein R_1 and R_2 are each hydrogen or methyl, in high yields of high purity comprising isomerizing a 1,2,3,6,-tetrahydrophthalic anhydride or a derivative thereof represented by the formula



wherein R_1 and R_2 are as defined above in the presence of (a) a palladium catalyst, and (b) an inorganic salt and/or a sulfur compound.

4,273,720

2-ARALKOXY-ANTHRAQUINONE DYESTUFFS

Roland Wald, Huningue, France, assignor to Sandoz Ltd., Basel, Switzerland

Filed Sep. 18, 1978, Ser. No. 943,339

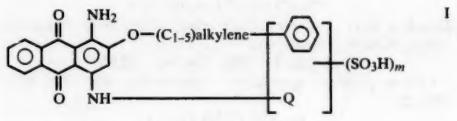
Claims priority, application Switzerland, Sep. 21, 1977, 11550/77; Sep. 21, 1977, 11551/77

Int. Cl.^{3} C07C *143/665*

U.S. Cl. 260—374 **16 Claims**

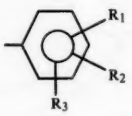
1. A 1-amino-4-arylamino anthraquinone dyestuff which is unsubstituted in the 3-position and bears in the 2-position an aralkoxy group, and in which at least one aryl group bears a sulpho group, which dyestuff is in free acid or salt form.

9. A compound which in the free acid form, is of formula I,



I

in which Q is a group (a)



(a)

in which

R_1 is hydrogen, hydroxy, halogen, (C_{1-4})alkyl, (C_{1-4})alkoxy or mono- or di(C_{1-4})alkylamino,

R_2 is hydrogen, halogen or (C_{1-4})alkyl, and

R_3 is hydrogen, (C_{1-9})alkyl, phenyl, phenoxy, halophenoxy or phenyl(C_{1-3})alkyl,

and m is a number from 1 up to the total sum of the benzene rings, excluding the anthraquinone nucleus, in the molecule,

and in which the sulpho groups are bound to such benzene rings with the proviso that each benzene ring bears no more than one sulpho group, which compound is in free acid or salt form.

4,273,721

TERTIARY AMINE POLYALKYLENE GLYCOL ESTERS, THEIR ADDITION SALTS AND THEIR QUATERNARY AMMONIUM COMPOUNDS

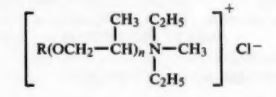
Ara Nersesian, Livingston, N.J., assignor to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 415,062, Nov. 12, 1973, abandoned, which is a continuation of Ser. No. 86,965, Nov. 4, 1970, abandoned. This application Sep. 21, 1977, Ser. No. 835,480

Int. Cl.^{3} C09F *5/00;* **C07C** *67/02;* **A61K** *7/06*

U.S. Cl. 260—404 **6 Claims**

1. Compounds of the formula:



wherein R is selected from the group consisting of acetyl, stearyl and lauroyl and n has an average value of 8 or 25.

4,273,722

METHOD OF ENHANCING ACTIVITY OF HOMOGENEOUS ZIEGLER-TYPE COPPER CATALYSTS

Sambasivarao Koritala, Peoria, Ill., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 8, 1980, Ser. No. 176,235

Int. Cl.^{3} C11C *3/12*

U.S. Cl. 260—409 **8 Claims**

1. In a method for hydrogenating polyunsaturated oil with a homogeneous Ziegler-type copper catalyst, the improvement comprising conducting said hydrogenation in the presence of an effective amount of an insoluble material selected from the group consisting of alumina, silica, alumina-silica, siliceous clays, and titanium dioxide.

4,273,723

PROCESS FOR PREPARING SILVER SALT OF ORGANIC CARBOXYLIC ACID

Yoshio Hayashi; Takeki Matsui; Tetsuo Shiga; Kageyasu Akashi; Minoru Akiyama, and Takeo Kimura, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sep. 5, 1979, Ser. No. 72,852
Claims priority, application Japan, Sep. 14, 1978, 53-112363
Int. Cl.[3] C11C *1/00*
U.S. Cl. 260—414 10 Claims

1. A process for preparing a silver salt of a fatty acid with 12 to 24 carbon atoms consisting essentially of reacting an alkali metal salt of the fatty acid with a water-soluble silver salt, and wherein the reaction is effected in a reaction system consisting essentially of (I) the alkali metal salt of the fatty acid, (II) the water-soluble silver salt, (III) at least one water-soluble or partially water-soluble C_3–C_8 alcohol and (IV) water, the volume ratio of the component (III) to the component (IV) being 1/5 to 5/1.

4,273,724

HYDROCARBON SYNTHESIS FROM CO AND H_2 USING TITANIUM PROMOTED BULK NICKEL CATALYSTS

Edwin L. Kugler, Summit, N.J., and Robert L. Garten, Cupertino, Calif., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jul. 9, 1979, Ser. No. 56,111
Int. Cl.[3] C07C *1/04*
U.S. Cl. 518—715 5 Claims

1. A process for the synthesis of higher molecular weight paraffinic hydrocarbons of from C_2 to C_7 carbon number comprising the steps of passing CO and H_2 at a CO/H_2 ratio of from 10 to 0.1, at a space velocity of from 100 hr^{-1} to 50,000 hr^{-1}, at a temperature of from 100° to 500° C. and at pressures of from 103 to 1.03×10^5 kPa over a catalyst comprising bulk nickel promoted with from 0.07 to 10 wt.% titanium containing oxide (calculated as TiO_2) for a time sufficient to effect the generation of the desired paraffinic products.

4,273,725

PROCESS FOR PREPARING CHLOROTHIOLFORMATES

James A. Cook, Jr., Barberton, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 25, 1979, Ser. No. 60,319
Int. Cl.[3] C07C *153/01;* C07B *29/00;* C07C *51/58*
U.S. Cl. 260—455 R 21 Claims

1. In the process of preparing organic chlorothiolformates by reacting an organic mercaptan having the formula,

R—SH

with phosgene, the improvement which comprises conducting said reaction in the presence of a catalytic amount of a secondary amine catalyst having the formula,

R_1R_2NH or $R_1R_2NH.HCl$

wherein R is alkyl, cycloalkyl, cycloalkylmethyl, lower alkenyl, aryl, alkaryl, aralkyl, haloaryl, haloarylalkyl and carboalkoxyalkyl, and R_1 and R_2 are each selected from the group consisting of C_1–C_{12} alkyl, C_3–C_4 alkenyl, C_3–C_6 cycloalkyl, C_3–C_6 cycloalkylmethyl, lower alkyl substituted C_3–C_6 cycloalkyl, C_6–C_{10} aryl, halo-substituted C_6–C_{10} aryl, lower alkyl substituted C_6–C_{10} aryl, C_6–C_{10} aralkyl and halo-substituted C_6–C_{10} aralkyl.

4,273,726

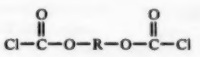
POLYOL (ALLYL CARBONATE) SYNTHESIS UTILIZING SOLID ALKALI METAL HYDROXIDE

Senol Altuglu, Doylestown, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 13, 1979, Ser. No. 93,424
Int. Cl.[3] C07C *68/02*
U.S. Cl. 260—463 2 Claims

1. In a method of reacting

(1) a linear diol bis(chloroformate) having the formula:



where R is chosen from the group consisting of ethylene, trimethylene, methylethylene, tetramethylene, ethylethylene, pentamethylene, hexamethylene, 2-methylhexamethylene, octamethylene, decamethylene, —CH_2—O—CH_2—, —CH_2CH_2—O—CH_2CH_2—, —CH_2—O—CH_2CH_2—, —$CH_2CH_2CH_2$—O—$CH_2CH_2CH_2$—, —CH_2CH_2—O—CH_2CH_2—O—CH_2CH_2—, and —CH_2—O—CH_2CH_2—O—CH_2— groups; with

(2) an allyl alcohol in the presence of sodium hydroxide and water to form the linear diol bis(allyl carbonate) thereof, the improvement comprising feeding aqueous and anhydrous sodium hydroxide to the reaction, where said sodium hydroxide is from 54 to 61 weight percent of the total sodium hydroxide, anhydrous basis, and water initially fed to the reaction.

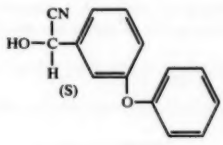
4,273,727

(S) α-CYANO-3-PHENOXY-BENZYL ALCOHOL

Jacques Martel, Bondy; Jean Tessier, Vincennes; Andre Teche, Nanterre, and Jean-Pierre Demoute, Montreuil-sous-Bois, all of France, assignors to Roussel Uclaf, Paris, France

Filed Dec. 28, 1978, Ser. No. 973,791
Claims priority, application France, Jan. 31, 1978, 78 02621
Int. Cl.[3] C07C *121/75*
U.S. Cl. 260—465 F 2 Claims

1. (S) α-cyano-3-phenoxy-benzyl alcohol of the formula



free of its (R) form.

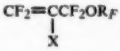
4,273,728

POLYFLUOROALLYLOXY COMPOUNDS, THEIR PREPARATION AND COPOLYMERS THEREFROM

Carl G. Krespan, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 20,354, Mar. 14, 1979, abandoned, which is a continuation-in-part of Ser. No. 850,729, Nov. 11, 1977, abandoned, which is a continuation-in-part of Ser. No. 747,029, Dec. 2, 1976, abandoned. This application May 1, 1980, Ser. No. 145,757
Int. Cl.[3] C07C *121/30, 121/34*
U.S. Cl. 260—465.6 7 Claims

1. A polyfluoroallyloxy compound having the formula:



wherein X is —Cl or —F, and R_F is:

$$-\mathrm{CFR^1CFCN} \quad \text{(i)}$$
$$\quad\ \mathrm{Y}\quad\ \mathrm{Y'}$$

wherein R^1 is a carbon-carbon bond or a linear or branched perfluoroalkylene group of 1 to 12 carbon atoms; Y and Y', independently, are —F or $—CF_3$ providing that only one of Y and Y' can be $—CF_3$; or

$$-\mathrm{CF(CF_2CN)_2} \quad \text{(ii)}$$

$$-(\mathrm{CF_2CFO})_n\mathrm{R^3CN} \quad \text{(iii)}$$
$$\quad\ \mathrm{Y}$$

wherein R^3 is a linear or branched perfluoroalkylene group of carbon content such that the moiety

$$-(\mathrm{CF_2CFO})_n\mathrm{R^3}$$
$$\quad\ \mathrm{Y}$$

does not exceed 15 carbon atoms; Y is —F or $—CF_3$; and n is 1 to 4.

4,273,729

POLYFLUOROALLYLOXY COMPOUNDS, THEIR PREPARATION AND COPOLYMERS THEREFROM

Carl G. Krespan, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 20,354, Mar. 14, 1979, abandoned, which is a continuation-in-part of Ser. No. 850,729, Nov. 11, 1977, abandoned, which is a continuation-in-part of Ser. No. 747,029, Dec. 2, 1976, abandoned. This application May 1, 1980, Ser. No. 145,758

Int. Cl.³ C07C *143/16, 57/76*

U.S. Cl. 260—543 F **12 Claims**

1. A polyfluoroallyloxy compound having the formula:

$$\mathrm{CF_2{=}\underset{\mathrm{X}}{\underset{|}{C}}CF_2OR_F}$$

wherein

X is —Cl or —F, and

R_F is:

$$-\mathrm{CFR^1CFQ} \quad \text{(i)}$$
$$\quad\ \mathrm{Y}\quad\ \mathrm{Y'}$$

wherein

R^1 is a carbon-carbon bond or a linear or branched perfluoroalkylene group of 1 to 12 carbon atoms;

Q is $—SO_2F$ or —COF;

Y and Y', independently, are —F or $—CF_3$ providing that only one of Y and Y' can be $—CF_3$; or

(ii) $—CF(CF_2COF)_2$, or

$$-(\mathrm{CF_2CFO})_n\mathrm{R^3Q'} \quad \text{(iii)}$$
$$\quad\ \mathrm{Y}$$

wherein R^3 is a linear or branched perfluoroalkylene group of carbon content such that the moiety

$$-(\mathrm{CF_2CFO})_n\mathrm{R^3}$$
$$\quad\ \mathrm{Y}$$

does not exceed 15 carbon atoms; Y is —F or $—CF_3$; n is 1 to 4; and Q' is defined as for Q above; or

$$-\mathrm{CF_2CF_2\overset{\mathrm{O}}{\overset{\|}{C}}CF_2COF.} \quad \text{(iv)}$$

4,273,730

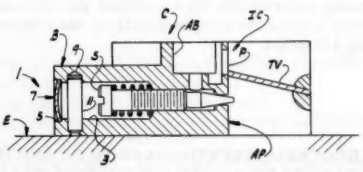
TAMPER RESISTANT IDLE ADJUSTMENT SCREW

Thomas J. Byrnes, Jr., St. Charles, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Nov. 19, 1979, Ser. No. 95,465

Int. Cl.³ F02M *3/08*

U.S. Cl. 261—41 D **3 Claims**



1. In a carburetor for an internal combustion engine, the carburetor having a body through which an air passage extends and an idle speed fuel circuit for supplying fuel to the passage to mix with air and form an air-fuel mixture combusted in the engine, and an idle adjustment screw for adjusting the quantity of fuel mixed with air to make the resultant mixture richer or leaner, the idle adjustment screw being settable during flow testing of the carburetor to an initial adjustment position, the improvement comprising means for making the idle adjustment screw tamper resistant to inhibit further adjustment of the screw after the carburetor is installed on the engine, the carburetor body having a cavity formed for the screw and a bore transverse to the longitudinal axis of the cavity, the tamper resistant means including a plug for sealing the open end of the cavity and a blocking pin inserted into the bore, the location of the bore being such that the blocking pin is between the idle adjustment screw and the plug, the length and diameter of the pin being such as to substantially block the cavity so an adjustment tool cannot be brought to bear on the idle adjustment screw even if the seal formed by the plug is violated and the length of the blocking pin further being such that the blocking pin is captured in the bore by staking or the like and cannot be removed therefrom whereby the tamper resisting means inhibits adjustment of the idle adjustment screw to produce an air-fuel mixture for which relatively higher engine emissions are produced than are produced with the idle adjustment screw set to its initial adjustment.

4,273,731

GAS/LIQUID EXCHANGE APPARATUS

Alec H. Laurie, 21 Lyndewode Rd., Cambridge, and John H. Kalicki, Old Farm Cottages, Stubbs Walden, Doncaster, both of England

Filed Oct. 26, 1976, Ser. No. 735,396

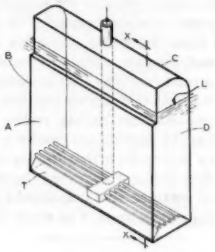
Claims priority, application United Kingdom, Oct. 31, 1975, 45397/75

Int. Cl.³ C02B *1/34*

U.S. Cl. 261—77 **6 Claims**

1. A gas injection or aeration device of the kind adapted to be immersed in a liquid and supplied with gas under pressure so that the gas emerges through diffusion nozzles of the device as a large quantity of small bubbles to form a gas/liquid mixture, wherein the diffusion nozzles are disposed in an upwardly extending bore of an open-ended conduit submerged in the liquid, the nozzles being located between 20 and 100 centime-

ters below the surface of the liquid and at least 20 centimeters below the upper open end of the conduit, and wherein the nozzles are disposed at a region where the bore of the conduit is restricted to an area which is between one sixth and one twelfth of the area of the remainder of the bore above said restricted region, the diffusion nozzles being constituted by a plurality of holes each arranged to introduce gas into the bore in a direction perpendicular to the direction of flow of liquid past said holes, said holes being arranged laterally of at least two pipes which pipes extend transversely across the bore of the conduit, the said restricted area of the bore comprising at least two elongated passages defined at least in part by said pipes, and wherein the diffusion nozzles open directly into these passages, the holes constituting the diffusion nozzles having diameters not exceeding 10 millimeters and the width of the passages not exceeding four times the diameter of the holes in order to establish laminar flow of liquid adjacent said holes to shear off bubbles of gas leaving said holes thereby producing a large number of small bubbles having a resultant combined large surface area, the flow of liquid past said holes inducing turbulence in the region of the riser tube above the diffusion nozzles to thus promote gas/liquid interchange.



4,273,732

METHOD AND APPARATUS FOR RAISING AN AERATION APPARATUS FOR LIQUIDS

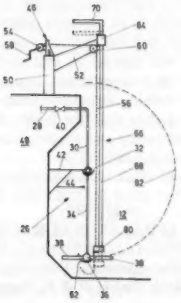
Walter H. Roediger, Frankfurt am Main, Fed. Rep. of Germany, assignor to Wilhelm Roediger GmbH & Co., Hanau am Main, Fed. Rep. of Germany

Filed Nov. 16, 1979, Ser. No. 94,997

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1978, 2850119

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—122 **7 Claims**



1. An apparatus for raising a liquid aeration apparatus submerged in a basin and including a generally horizontal air distributing pipe (**36**) having a plurality of ceramic aeration tubes (**38**) extending outwardly therefrom, said aeration apparatus being connected with a stationary support (**42**) by means of an air supply pipe (**34**) through a joint (**32**) about which said aeration apparatus can be pivotally raised, a cable (**56**), a carrier element (**62**) coupled to a free end of the cable for engaging the air distributing pipe, and a boom (**52**) disposed above the surface of a liquid over the free end of which boom said cable is guided, characterized by:

(a) the free end of said boom being disposed vertically above the submerged air distributing pipe,

(b) guide means (**64**) mounted on the free end of said boom,

(c) a guide rod (**66**) mounted in said guide means for:

(1) axially slidable movement, and

(2) limited pivotal movement in a plane perpendicular to the air distributing pipe,

(d) means for detachably connecting the carrier element to a lower end of the guide rod, and

(e) the boom being movably mounted to the basin for operative placement at a plurality of sites, whereby the guide rod may be pivoted out of the path of the aeration tubes to prevent their damage, the carrier element may be lowered by the guide rod to a depth greater than that of the air distributing pipe and thereafter brought beneath the pipe by pivoting back the guide rod, the rod may be detached from the carrier element and retracted, and the cable may be taken up to raise the carrier element and aeration apparatus engaged thereby.

6. A method for raising a submerged liquid aeration apparatus including an air distributing pipe (**36**) and a plurality of ceramic aeration tubes (**38**) extending perpendicularly therefrom, a stationary support (**42**), an air supply pipe (**34**) connected at one end to the air distributing pipe and connected at its other end with the stationary support through a rotatable joint (**32**) about which the aeration apparatus can be pivoted, a cable (**56**) having a carrier element (**62**) coupled to its free end for engaging the air distributing pipe, a boom (**52**) mounted above the surface of the liquid with its free end disposed vertically above the air distributing pipe, means for guiding the cable over said free end of the boom, guide means (**64**) mounted on the free end of the boom, and a guide rod (**66**) slidably mounted in the guide means for guiding the carrier element into engagement with the air distributing pipe, characterized by the following steps:

(a) connecting the guide rod to the carrier element,

(b) lowering the guide rod into the liquid until a short shank (**70**) of the guide rod comes into abutment with the guide means,

(c) disconnecting the guide rod from the carrier element, and

(d) taking in the cable to rotate the aeration apparatus upwardly.

4,273,733

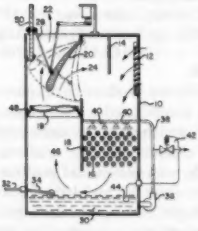
APPARATUS FOR COOLING FLUIDS

Walter Kals, Hastings-on-Hudson, N.Y., assignor to Niagara Blower Company, New York, N.Y.

Filed Jul. 30, 1979, Ser. No. 61,725

Int. Cl.³ F28D *5/02*

U.S. Cl. 261—151 **25 Claims**



1. A heat device for cooling a fluid, said device comprising:

housing means having an air duct means passing therethrough;

propeller means disposed in said air duct means, said propeller means being operative to draw a stream of air through said air duct means;

cooling means disposed in said air duct means upstream of said propeller means;

conduction means in operative connection with said cooling means for conducting fluid through said cooling means whereby said stream of air passing over said cooling means absorbs heat from said fluid being conducted through said cooling means;

recirculation means disposed downstream of said propeller means for selectively recirculating portions of said air stream in said air duct means downstream of said propeller means back to said air duct means at a point upstream of said cooling means, said recirculation means comprising a blade means of an air foil configuration pivoted about its trailing edge to be selectively positioned, to recirculate all, some or none of the air stream passing through said air duct means; and

the air duct portions adjacent the upstream and downstream sides of said propeller means being of a substantially straight flow path configuration when said blade means is disposed to preclude recirculation of said air stream.

4,273,734

CASTING OF POLYELECTROLYTES IN HYDROGEL MOLDS

Maurice Seiderman, 3306 Deronda Dr., Hollywood, Calif. 90068

Filed Sep. 24, 1979, Ser. No. 78,196

Int. Cl.³ B29D *11/00*

U.S. Cl. 264—1.1 **8 Claims**

1. The method of preparing a three-dimensional, irreversibly gelled shaped article, which method comprises diffusing gel-forming ions into a solution of a polyelectrolyte capable of insolubilization upon interaction with said gel-forming ions, whereby to produce the irreversibly gelled insoluble shaped polyelectrolytic article, the said gel-forming ions being diffused into the polyelectrolyte solution by transport from a hydrogel which defines a mold cavity and is swollen with a solution comprising said gel-forming ions.

4,273,735

PRODUCTION OF SPHEROIDAL ALUMINA SHAPED ARTICLES

Roland Jacques, Ales, and Regis Poisson, Sevres, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Continuation-in-part of Ser. No. 929,772, Jul. 31, 1978, abandoned. This application Aug. 29, 1979, Ser. No. 70,866

Claims priority, application France, Aug. 3, 1977, 77 23880

Int. Cl.³ B01J *37/02*

U.S. Cl. 264—5 **30 Claims**

1. A process for the production of spheroidal alumina shaped articles, which comprises dispersing an ungelled admixture of an alumina sol and hexamethylenetetramine, in the form of droplets, into a liquid forming medium which is but very slightly miscible with water, said medium being at a temperature of between about 50° and 105° C., next aging the alumina spheres thus shaped at a temperature greater than about 105° C. at superatmospheric pressure, then secondarily aging said alumina spheres in a basic medium, and thence washing, drying and calcining said aged alumina spheres.

4,273,736

METHOD FOR PREPARING PACKING FOR A SODIUM-MERCURY AMALGAM DECOMPOSER REACTOR

Harshad M. Patel, Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.

Division of Ser. No. 910,166, May 26, 1978, Pat. No. 4,165,981, which is a division of Ser. No. 666,027, Mar. 11, 1976, Pat. No. 4,105,441. This application May 3, 1979, Ser. No. 35,563

Int. Cl.³ B29D *27/00;* **B29J** *1/00*

U.S. Cl. 264—45.3 **13 Claims**

1. The method of preparing a packing composition for use as a packing in a decomposer reactor for sodium mercury amalgam which comprises admixing particles of a surface active element selected from the group consisting of iron, cobalt, nickel, graphite, molybdenum, vanadium, and mixtures thereof with particles of a resin capable of being cured to a thermally stable condition, wherein said resin is selected from the group consisting of polyphenylene sulfide resins, polyphenylene oxide resins, imid resins, heating the resulting mixture to cure said resin to form a polymeric matrix having discrete particles of said surface active element dispersed therein, and forming the resulting cured mixture into granules having an average diameter in the range from about 6 to about 70 millimeters.

4,273,737

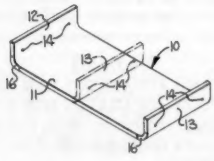
METHOD AND APPARATUS FOR MANUFACTURING FURNITURE

Erich Grachten, Detmold, Fed. Rep. of Germany, assignor to Burris Industries, Inc., Lincolnton, N.C.

Filed Feb. 13, 1975, Ser. No. 549,519

Int. Cl.³ B29C *5/00;* **B29D** *27/04;* **B29C** *27/00*

U.S. Cl. 264—46.5 **6 Claims**



1. A method of manufacturing furniture by joining panels and making corners, the method comprising the steps of providing wooden panels each having generally parallel generally planar major faces and a generally planar end surface substantially perpendicular to and bounding one edge of said major faces, heating the panels to an elevated temperature, arranging mold instrumentalities and two heated panels to form a mold cavity bounded by the repsective end surfaces of the two panels and the mold instrumentalities, depositing in the mold cavity reactants for forming structural foam and bonding the two heated panels together with the foam while confining the foam within the mold cavity and shaping the foam into a predetermined corner configuration.

4,273,738

METHOD AND APPARATUS FOR FORMING, AND TRIMMING, THREE-DIMENSIONAL WORK PIECES

Ernst M. Spengler, Heusenstamm, Fed. Rep. of Germany, assignor to Stanztechnik GmbH R & S, Bergen-Enkheim, Fed. Rep. of Germany

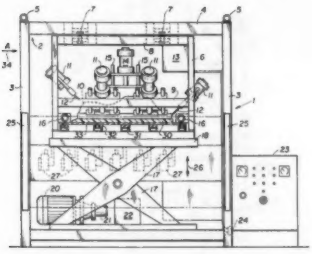
Filed Dec. 4, 1978, Ser. No. 965,745

Int. Cl.³ B29C *1/16, 17/10;* **B26D** *1/06*

U.S. Cl. 264—154 **18 Claims**

1. A method for three-dimensionally cutting or trimming a three-dimensional work piece, comprising the steps of moving a work piece support which carries first three-dimensional tool means against second three-dimensional tool means to thereby

securely hold a three-dimensional work piece introduced between said first and second three-dimensional tool means, maintaining at least one of said first and second three-dimensional tool means substantially stationary when the first and second three-dimensional tool means hold said three-dimensional work piece in a cutting or trimming position, then rigidly locking the first and second three-dimensional tool means in a fixed position relative to a main frame for introducing the cutting or trimming pressure into said main frame, then moving independent third tool means through at least one of said first



and second tool means for performing said three-dimensional cutting or trimming along three-dimensionally extending contours, and supporting said second three-dimensional tool means and at least one of the independent third tool means including actuator means for said at least one independent third tool means on secondary frame means removably attached to said main frame in an exchangeable manner whereby the secondary frame means and the second and third tool means attached thereto are exchangeable as a unit for facilitating the retooling.

4,273,739

METHOD OF DEFORMING THERMOPLASTIC POLYMERS USING AMMONIA AS A REVERSIBLE PLASTICIZER

Roger S. Porter, and Anagnostis E. Zachariades, both of Amherst, Mass., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 12, 1979, Ser. No. 56,767
Int. Cl.³ D01F *1/02*
U.S. Cl. 264—211 **10 Claims**

1. In a method of deforming thermoplastic polymers with interchain hydrogen bonding, the steps of

exposing the polymer to ammonia so as to have sufficient ammonia absorbed therein to serve as a plasticizer;

deforming said treated polymer in a manner that permits said ammonia to remain in said polymer during the deformation process; and

releasing said ammonia thereafter from the deformed polymer.

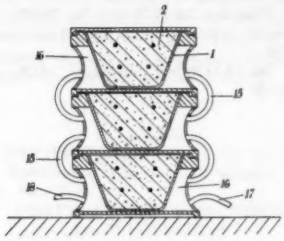
4,273,740

PROCESS AND APPARATUS FOR MANUFACTURING SINGLE PIECE RAILROAD TIES OF PRESTRESSED CONCRETE

Sergio Marchesi, and Gino Fachin, both of Rome, Italy, assignors to Vianini, S.p.A., Rome, Italy

Continuation of Ser. No. 825,557, Aug. 18, 1977, abandoned. This application Oct. 9, 1979, Ser. No. 82,481
Claims priority, application Italy, Dec. 30, 1976, 52836 A/76
Int. Cl.³ B28B *23/04, 21/78*
U.S. Cl. 264—228 **2 Claims**

1. A process for manufacturing prestressed concrete items, including the steps of pretensioning tendons in a mold, pouring concrete into the mold, placing the mold with concrete therein in a controlled environment having a temperature of between about 60° C. to 80° C. until the concrete is sufficiently cured to support the pretensioned load in the tendons, releasing the tendons from the mold and removing the cast concrete from the mold wherein the improvement comprises heating the concrete prior to said step of pouring the concrete into the



mold, sealing the mold substantially immediately after the step of pouring the concrete into the mold and heating the mold substantially immediately after the step of pouring the concrete into the mold.

4,273,741

DEVICE FOR OBTAINING STOOL SAMPLES

Robert A. Levine, 31 Pilgrim La., Guilford, Conn. 06437

Continuation-in-part of Ser. No. 55,636, Jul. 9, 1979. This application Jan. 7, 1980, Ser. No. 110,437
Int. Cl.³ G01N *1/02, 33/52, 33/72*
U.S. Cl. 422—56 **3 Claims**

1. A stool sampling device for obtaining direct anal stool samples, said device comprising:

(a) a first sheet of pliant impermeable material;

(b) a pad secured to one side of said first sheet, said pad being operable to receive a stool smear when said device is drawn across a patient's anus after defecation;

(c) a second sheet of pliant material disposed on said first sheet, said second sheet overlying said one side of said first sheet, and said second sheet including stool volume controlling openings therethrough aligned with said pad;

(d) first releasable adhesive means securing said second sheet to said first sheet whereby said second sheet can be peeled off of said first sheet after a stool smear has been deposited on said pad;

(e) means for hermetically sealing said pad within said first sheet after a stool smear has been deposited on said pad;

(f) means forming an opening in said first sheet which opening is aligned with said pad when the latter is sealed within said first sheet;

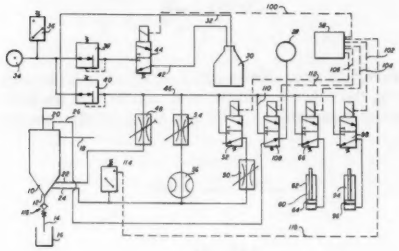
(g) a pliant impermeable cover sheet hermetically sealing said opening in said first sheet; and

(h) second releasable adhesive means securing said cover sheet to the other side of said first sheet, said second adhesive means forming means whereby said cover sheet can be peeled away from said first sheet to uncover said opening in said first sheet to expose said pad for the application of detecting reagents to the stool smear, and whereby said cover sheet can be resealed to said first sheet after the stool smear has been tested.

4,273,742
DRAIN APPARATUS FOR THE REACTION VESSEL IN AN ATOMIC ABSORPTION INSTRUMENT

Bernhard Huber, and Winfried Gönner, both of Überlingen, Fed. Rep. of Germany, assignors to Bodenseewerk Perkin-Elmer, Überlingen, Fed. Rep. of Germany

Filed Sep. 26, 1979, Ser. No. 78,977
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1978, 2851058
Int. Cl.³ G01N *27/66, 21/13, 33/20*
U.S. Cl. 422—80 5 Claims



1. A system for the measurement of the atomic absorption of gaseous samples comprising:

a reaction vessel,

first, second and third conduit means for supplying a liquid sample, a carrier gas, and at least one reagent, respectively, to said reaction vessel,

a discharge conduit means coupled between said reaction vessel and a measuring cell of an atomic absorption spectrometer,

a valve means disposed in said discharge conduit means for permitting the flow of a gaseous sample from said reaction vessel to said measuring cell when said valve is open and for preventing the flow of said gaseous sample from said reaction vessel to said measuring cell when the valve is closed,

control means for controlling the flow of liquid sample, carrier gas, reagent and gaseous sample through said first, second, third and gaseous discharge conduit means, respectively, in accordance with a predetermined program for making consecutive measurements and including means coupled to said valve means for closing said valve means at the end of the first measurement and opening said valve means for a subsequent measurement,

means for draining said reaction vessel including a drain conduit means and a relief valve in said conduit means,

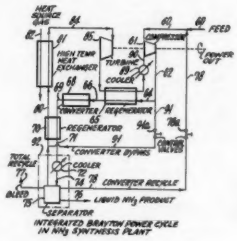
a pressure sensor in communication with said carrier gas conduit means for sensing pressure in said reaction vessel above a specified pressure indicative of incomplete draining of said reaction vessel and below said specified pressure indicative of a substantially complete draining of said reaction vessel,

said control means being coupled to said pressure sensor and responsive to a pressure above said specified pressure in said reaction vessel to disable the system from a subsequent measurement.

4,273,743
COMBINATION CHEMICAL PLANT AND BRAYTON-CYCLE POWER PLANT

Everett M. Barber, Wappingers Falls; James R. Muenger, Beacon, and David L. Alexander, Fishkill, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 956,958, Nov. 2, 1978, Pat. No. 4,224,299, which is a continuation of Ser. No. 765,475, Feb. 4, 1977, abandoned. This application Dec. 10, 1979, Ser. No. 101,599
Int. Cl.³ C01C *1/04;* B01J *8/02;* G05D *7/00;* F01K *25/08*
U.S. Cl. 422—148 7 Claims



1. An ammonia synthesis plant wherein gaseous nitrogen and hydrogen are subjected to high pressure catalytic reaction to produce ammonia comprising a compressor, fluid conduit means for supplying gaseous nitrogen and hydrogen to said compressor, first indirect heat exchange means, fluid conduit means for supplying compressed gases from said compressor to said first indirect heat exchange means, a catalytic converter for converting gaseous nitrogen and hydrogen to ammonia, fluid conduit means for supplying compressed gaseous nitrogen and hydrogen from said first indirect heat exchange means to said converter, second indirect heat exchange means, fluid conduit means supplying ammonia-containing gases from said converter to said second indirect heat exchange means, a first cooler, fluid conduit means supplying ammonia-containing gases from said second indirect heat exchange means to said first cooler, separator means for separating liquid ammonia from unconverted gaseous nitrogen and hydrogen, fluid conduit means for supplying unconverted gaseous nitrogen and hydrogen to said separator means from said first cooler, liquid ammonia product recovery means connected to said separator, third indirect heat exchange means, fluid conduit means for passing unconverted gaseous nitrogen and hydrogen from said separator through said second indirect heat exchange means to said third indirect heat exchange means, a gas turbine operatively connected to said compressor, fluid conduit means supplying heated unconverted gaseous nitrogen and hydrogen from said third indirect heat exchange means to said gas turbine, fluid conduit means for passing exhaust gaseous nitrogen and hydrogen from said gas turbine to said first indirect heat exchange means, a second cooler, fluid conduit means for supplying cooled exhaust gaseous nitrogen and hydrogen from said first indirect heat exchange means to said second cooler and fluid conduit means for supplying resulting cooled unconverted gaseous nitrogen and hydrogen from said second cooler to said compressor.

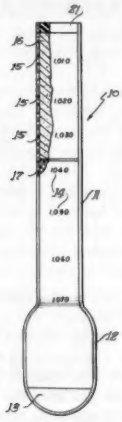
4,273,744
DEVICE FOR AUTOMATIC ADDITION OF A CORROSION INHIBITOR TO A COOLANT SYSTEM

Robert H. Krueger, Palatine, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Continuation of Ser. No. 964,225, Nov. 27, 1978, abandoned. This application Oct. 16, 1979, Ser. No. 85,344
Int. Cl.³ B01D *11/02*
U.S. Cl. 422—265 3 Claims

1. A device for the automatic addition of corrosion inhibitor to a coolant system, comprising a hydrometer having an elon-

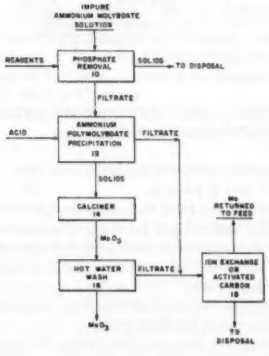
gated hollow stem with an enlarged weighted lower end, the hollow stem having an upper portion adapted to receive a corrosion inhibitor, said stem having a plurality of small openings opposite the corrosion inhibitor to allow ingress of liquid therein to dissolve the inhibitor when the position of the hydrometer drops relative to the liquid level as the specific gravity of the liquid decreases, said openings being spaced axially along the hollow stem in annular rows so as to dissolve layers of inhibitor sequentially, and separators in said hollow stem to divide the inhibitor into several equal portions with an annular row of openings opposite each portion.



4,273,745
PRODUCTION OF MOLYBDENUM OXIDE FROM AMMONIUM MOLYBDATE SOLUTIONS

John M. Laferty, Wheat Ridge; Dennis L. Howe, Arvada, both of Colo., and Roger F. Sebenik, Ann Arbor, Mich., assignors to AMAX Inc., Greenwich, Conn.

Filed Oct. 3, 1979, Ser. No. 81,412
Int. Cl.³ C01G *39/02*
U.S. Cl. 423—54 **14 Claims**

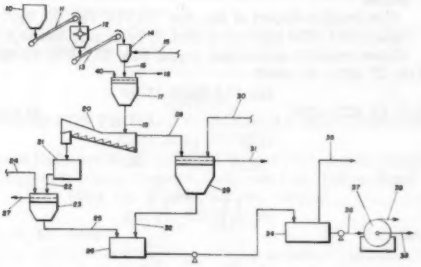


1. A process for recovering molybdenum trioxide from an ammonium molybdate solution containing phosphate anions and more than about 500 ppm U_3O_8 which comprises aging the ammonium molybdate solution to lower the U_3O_8 content to less than about 10 ppm, digesting a precipitant of at least one water-soluble compound of at least one metal selected from the group consisting of iron, calcium, aluminum and magnesium in small but effective amounts to precipitate at least about 50% of the phosphate anions in the ammonium molybdate solution for a time sufficient to precipitate the phosphate anions, separating the phosphate precipitate from the ammonium molybdate solution, then acidifying the ammonium molybdate solution with at least one mineral acid selected from the group consisting of sulfuric acid and nitric acid to provide a final pH value of between about 2.5 and about 4.5 to precipitate an ammonium polymolybdate compound and calcining the ammonium polymolybdate compound at a temperature below about 700° C. to produce a molybdenum trioxide product.

4,273,746
DESULFATION OF BATTERY MUD

Michael A. Kolakowski, Milltown, N.J., assignor to NL Industries, Inc., New York, N.Y.

Filed Oct. 10, 1978, Ser. No. 950,073
Int. Cl.³ C01G *21/14*
U.S. Cl. 423—92 **2 Claims**

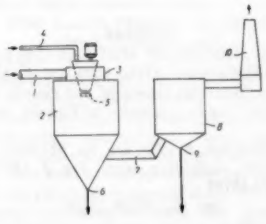


1. A process for desulfating battery mud, comprising:
(a) Adding an aqueous solution containing an ammonium reagent selected from the group consisting of ammonium carbonate, ammonium bicarbonate, and admixtures thereof to a lead sulfate-containing battery mud maintained at a temperature of less than about 140° F. at substantially atmospheric pressure to form an aqueous slurry of ammonium sulfate and precipitated lead carbonate having a solids content of from about 10% to 20%, and
(b) separating said ammonium sulfate slurry from said lead carbonate containing battery mud.

4,273,747
PROCESS FOR REMOVAL OF MERCURY VAPOR FROM WASTE GASES

Elisabeth L. Rasmussen, Holte, Denmark, assignor to A/S Niro Atomizer, Soborg, Denmark

Filed May 16, 1980, Ser. No. 150,585
Claims priority, application Denmark, May 18, 1979, 2051/79
Int. Cl.³ B01D *53/34*
U.S. Cl. 423—210 **4 Claims**



1. A process for removal of mercury vapor from a stream of fly ash-containing waste gas resulting from the incineration of

refuse, said stream having a temperature of at least 200° C., comprising the steps of

(a) atomizing an aqueous liquid into said stream without previous removal of fly ash therein, said liquid being atomized in a quantity higher than the one which would cool said stream to a temperature of 160° C., but which quantity is lower than the one which would give incomplete water evaporation from the atomized liquid or condensation of water vapor in subsequent handling of the gas stream, and

(b) separating the fly ash together with a substantial part of the mercury originally present as vapor in a particle collector unit.

4,273,748

PROCESS FOR REMOVING HARMFUL COMPONENTS FROM GAS

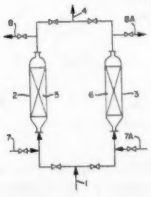
Toshihiko Takahashi; Morihisa Maruko, and Shoichi Kimura, all of Kudamatsu, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 771,911, Feb. 25, 1977, abandoned. This application Jun. 1, 1979, Ser. No. 44,583

Claims priority, application Japan, Feb. 27, 1976, 51-19902; Feb. 27, 1976, 51-19931

Int. Cl.³ B01D *53/34*

U.S. Cl. 423—230 **33 Claims**



1. A process for removing hydrogen sulfide and ammonia from a reducing gas containing hydrogen sulfide and ammonia, which comprises contacting said reducing gas containing hydrogen sulfide and ammonia with a first removing agent at a temperature in the range of 450°–700° C., said first removing agent including at least one of nickel and nickel oxides or at least one of iron and iron oxides and being capable of converting hydrogen sulfide in the reducing gas to nickel sulfide or iron sulfide but being substantially incapable of decomposing ammonia at a temperature in the range of 450°–700° C., thereby converting hydrogen sulfide contained to nickel sulfide or iron sulfide and removing hydrogen sulfide from the gas, and removing less than 10% of the ammonia from the reducing gas, then contacting the reducing gas with a second removing agent at a temperature greater than 700° C., said second removing agent including at least one of nickel and oxides and nitrides of nickel or at least one of iron and oxides and nitrides of iron and being capable of decomposing ammonia at a temperature greater than 700° C., thereby decomposing ammonia and removing ammonia contained from the reducing gas.

4,273,749

REFINING PROCESS OF HOT GAS CONTAINING HYDROGEN SULFIDE AND AMMONIA

Shoichi Kimura; Toshihiko Takahashi, and Zensuke Tamura, all of Kudamatsu, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 5, 1978, Ser. No. 912,949

Claims priority, application Japan, Jun. 3, 1977, 52-64713; Jun. 6, 1977, 52-65793

Int. Cl.³ B01D *53/34*

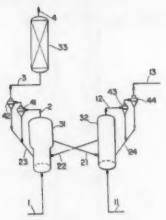
U.S. Cl. 423—231 **21 Claims**

1. A process for refining hot gas containing hydrogen sulfide and ammonia, comprising the steps of:

providing a gas containing substantial amounts of hydrogen sulfide and ammonia that are desired to be removed from the gas;

contacting the gas at a temperature in the range of 600°–850° C. with an iron oxide catalyst in a first container to remove hydrogen sulfide;

contacting the gas at a temperature in the range of 700°–900°



C. with a catalyst obtained by reducing iron oxide with a reducing agent to produce elemental iron, to remove ammonia from the gas in a second container; and

contacting the gas at a temperature of 600° C. or less in a third container with iron oxide to remove hydrogen sulfide remaining in the gas after the first hydrogen sulfide removal step and the ammonia removal step.

4,273,750

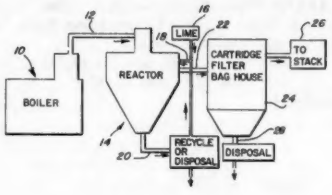
FLUE GAS DESULFURIZATION APPARATUS AND METHOD

Grant T. Hollett, Jr., Elmhurst, and Francis S. Flick, Oak Brook, both of Ill., assignors to Energy and Pollution Controls, Inc., Bensenville, Ill.

Filed Apr. 24, 1979, Ser. No. 32,872

Int. Cl.³ B01D *53/08*

U.S. Cl. 423—244 **24 Claims**



1. An apparatus for removing gaseous and particulate pollutants from a polluted gas, comprising:

a chamber;

means communicating with said chamber for receiving gas cleaned by said apparatus;

a conduit having an inlet and a discharge and defining a substantially vertical gas flow path, said inlet communicating with a source of said polluted gas and said discharge communicating with said chamber and said clean gas receiving means;

means for introducing substantially dry, particulate sorbent or reactant to said gas flow path;

means mounted in said gas flow path for receiving and distributing at least a portion of said dry sorbent or reactant particles across said gas flow path to entrain said sorbent or reactant particles in said gas;

means for separating said sorbent or reactant particles and said polluted particles from said gas and directing said gas to said clean gas receiving means; and,

means mounted within said gas flow path for recirculating by counterflow at least a portion of said gas, said sorbent or reactant particles and said pollutant particles therein

prior to separation of said sorbent or reactant particles and said pollutant particles from said gas.

22. A method of removing gaseous and particulate pollutants from flue gas by sorption or reaction of said pollutants on or with discrete particles of substantially liquid-free sorbent or reactant, said method comprising the consecutive steps of:

(a) defining a substantially vertical gas flow path from a source of said flue gas to a clean gas discharge means;

(b) causing polluted flue gas to flow downwardly through said flow path;

(c) uniformly distributing said discrete sorbent or reactant particles across said gas flow path to effect intimate contact between said flue gas and said sorbent or reactant particles and to entrain at least a portion of said sorbent or reactant particles in said gas;

(d) recirculating at least a portion of said polluted flue gas and entrained sorbent or reactant particles and said pollutant particles within said gas flow path by counterflow to enhance the time of contact between said polluted flue gas and said sorbent or reactant particles;

(e) changing the direction of flow of said flue gas and entrained sorbent or reactant particles and said pollutant particles to separate said entrained particles from said gas; and

(f) directing said gas into said clean gas discharge means.

4,273,751

REMOVAL OF ACIDICA CONTAMINANTS FROM GAS STREAMS BY CAUSTIC IMPREGNATED ACTIVATED CARBON

Rabindra K. Sinha, Ranchi, India; Charles K. Polinsky, Pittsburgh, Pa.; Stephen D. Cifrulak, Sr., Sewickley, Pa., and Norman J. Wagner, Pittsburgh, Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 959,137, Nov. 9, 1978, Pat. No. 4,215,096. This application Apr. 9, 1980, Ser. No. 138,636

Int. Cl.³ B01D *53/34*

U.S. Cl. 423—244 **5 Claims**

1. A process for the removal of sulfur oxide gases and vapors from gas streams which comprises contacting the gas stream with activated carbon impregnated with about 0.5% to about 20% by weight of sodium hydroxide and about 4% to about 50% by weight of moisture.

4,273,752

PROCESS FOR MAKING RED PHOSPHORUS

Klaus Lehr, Hürth-Knapsack; Gero Heymer, Erftstadt; Hans-Werner Stephan, Cologne, and Ursus Thümmler, Erfstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 20, 1980, Ser. No. 123,106

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1979, 2907059

Int. Cl.³ C01B *25/01, 25/02, 25/04*

U.S. Cl. 423—322 **6 Claims**

1. A process of converting yellow phosphorus to red phosphorus which comprises: preheating a closed ball mill containing iron balls occupying it to an extent up to 20% of its volume and being provided with at least one hollow shaft to a temperature within the range 280° to 590° C.; introducing an inert gas into the preheated ball mill; continuously dosing molten yellow phosphorus into the preheated ball mill in portions per unit time permitting the temperature prevailing in the ball mill to be practically maintained until said ball mill has been filled with yellow phosphorus to an extent of at most 50% its volume; annealing the phosphorus in the ball mill kept rotating over a period of up to 15 hours at temperatures within the range 200° to 590° C.; allowing resulting red phosphorus to cool down to room temperature in the rotating ball mill; opening the ball mill and pouring water in it up to at least 75% its volume; closing the ball mill again; subjecting to wet grinding the red phosphorus in the ball mill by rotating the latter; and removing an aqueous suspension of red phosphorus from the ball mill.

4,273,753

DE-ALUMINIZATION OF ALUMINOSILICATES

Clarence D. Chang, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 10, 1979, Ser. No. 74,174

Int. Cl.³ C01B *33/28*

U.S. Cl. 423—328 **18 Claims**

1. A process for removing aluminum from crystalline aluminosilicate zeolites which comprises contacting a crystalline aluminosilicate zeolite with an inorganic halide or inorganic oxyhalide comprising a halogen and a non-halogen component to form an aluminum halide or aluminum oxyhalide and to deposit said non-halogen component in the crystalline aluminosilicate zeolite structure, at temperatures sufficiently high enough to volatilize the formed aluminum halide or aluminum oxyhalide and under conditions sufficient to remove the aluminum halide or aluminum oxyhalide from the crystalline aluminosilicate zeolite as a vapor.

14. The process of claim **1** wherein said crystalline aluminosilicate zeolite is mordenite.

4,273,754

PROCESS FOR PRODUCING AQUEOUS SOLUTION OF CALCIUM NITRITE

Makoto Endo, and Kohji Kusahara, both of Fuchumachi, Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

Filed Apr. 9, 1980, Ser. No. 138,667

Int. Cl.³ C01B *21/20*

U.S. Cl. 423—385 **6 Claims**

1. In a process for producing an aqueous solution of calcium nitrite having high purity and high concentration by contacting a nitrogen oxides containing gas with an aqueous slurry of calcium hydroxide, the improvement wherein a gas having a temperature of 190°–300° C. and having a nitrogen oxide concentration of 5 to 12 vol. % and a molar ratio of NO/NO_2 of 1.6 to 2.5 is contacted with the aqueous slurry having 20 to 40 wt. % of a calcium hydroxide content at 75° to 110° C. under a pressure high enough to prevent condensation of said slurry until the calcium hydroxide content is reduced to a range of 2 to 10 wt. % as a first stage; and the unabsorbed and unreacted gas is separated and the gas is oxidized at 85°–150° C. to form a gas having a nitrogen oxides concentration of 1 to 5 vol. % and a molar ratio of NO/NO_2 of 1.6 to 2.5 and the resulting gas is contacted with the aqueous slurry separated from the first stage and having 2 to 10 wt. % of a calcium hydroxide content and containing calcium nitrite, at 75° to 110° C. under a pressure high enough to prevent condensation of said slurry to reduce the calcium hydroxide content to less than 3 wt. % as a second stage and filtering the resulting solution.

4,273,755

PREPARATION OF PLATINUM COMPLEXES

Richard N. Rhoda, Suffern, N.Y., and Jeffrey N. Crosby, Worcester, England, assignors to MPD Technology Corporation, Wyckoff, N.J.

Filed Aug. 16, 1979, Ser. No. 65,553

Int. Cl.³ C01G *55/00*

U.S. Cl. 423—463 **9 Claims**

1. A process for preparing cis-$Pt(NH_3)_2Cl_2$ of high purity and in high yield comprising adding an aqueous solution of ammonium hydroxide to an aqueous dispersion of potassium tetraiodoplatinum(II), said tetraiodo compound having the formula K_2PtI_4, under a controlled gradually rising temperature profile while controlling the ammonium hydroxide addition so that the pH does not exceed about 7.5, to precipitate cis-$Pt(NH_3)_2I_2$, separating washing and drying the cis-$Pt(NH_3)_2I_2$ precipitate, treating the washed and dried cis-$Pt(NH_3)_2I_2$ with $AgNO_3$ to form a solution containing cis-$[Pt(NH_3)_2(H_2O)_2](NO_3)_2$ and a AgI precipitate by a method

comprising slowly adding the washed and dried cis-$Pt(NH_3)_2I_2$ to an aqueous solution of $AgNO_3$ at room temperature and with rapid stirring, warming the silver-containing mixture to a maximum temperature of about 50° C. and maintaining the temperature of about 50° C. for a period of time sufficient substantially to complete the reaction, then cooling the resultant silver-containing reaction mixture to room temperature and separating the precipitated AgI from the solution containing cis-$[Pt(NH_3)_2(H_2O)_2](NO_3)_2$, treating the solution containing cis-$[Pt(NH_3)_2(H_2O)_2](NO_3)_2$ to precipitate cis-$Pt(NH_3)_2Cl_2$ by addition of MCl, where M = Na or K, by the method comprising adding solid MCl rapidly to the solution of cis-$[Pt(NH_3)_2(H_2O)_2](NO_3)_2$ at room temperature, elevating the temperature of the cis-$Pt(NH_3)_2Cl_2$-forming mixture to a maximum temperature of about 75° C., maintaining the elevated temperature for a period of time sufficient to maximize formation of cis-$Pt(NH_3)_2Cl_2$, and then cooling the reaction mixture and separating the cis-$Pt(NH_3)_2Cl_2$ precipitate.

4,273,756

IMMUNOASSAY FOR CLASS SPECIFIC ANTIBODIES

Chung-Mei Ling, Antioch; Richard H. Decker, and Ruben Chairez, both of Deerfield, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Jul. 28, 1978, Ser. No. 928,651
Int. Cl.[2] G01N *33/16*; A61K *39/00, 43/00*
U.S. Cl. 424—1 **18 Claims**

1. A method for determining a class specific antibody to an antigen comprising:

(a) binding an antibody for a specific immunoglobulin class to a solid support to provide a class specific antibody reagent;

(b) reacting the class specific antibody reagent with test sample;

(c) removing unbound test sample to provide an antigen reagent;

(d) reacting the antigen reagent with a known labeled antigen, and

(e) removing unbound labeled antigen and measuring the amount of bound labeled antigen, thereby determining the amount of class specific antibody to the known antigen.

4,273,757

DETERMINATION OF TRANSCOBALAMINS

Jacob Selhub, Chicago, Ill.; Bracha Rachmilewitz, and Nathan Grossowicz, both of Jerusalem, Israel, assignors to Yissum Research Development Company, Jerusalem, Israel

Continuation-in-part of Ser. No. 802,379, Jun. 2, 1977, Pat. No. 4,167,556. This application Nov. 17, 1978, Ser. No. 961,771
The portion of the term of this patent subsequent to Sep. 11, 1996, has been disclaimed.
Int. Cl.[3] G01N *33/48*; A61K *43/00*
U.S. Cl. 424—1 **22 Claims**

1. A method for the quantitative determination of the individual and total unsaturated Vitamin B-12 binding capacities of the three transcobalamins TC-I, TC-II, and TC-III in serum, which method comprises the steps of incubating a predetermined quantity of serum with a solution of ^{57}Co Vitamin B-12 whereby the unsaturated Vitamin B-12 binding sites on the transcobalamins in said quantity of serum become occupied by the radioactive Vitamin B-12; contacting the resulting mixture with (a) a TC-II adsorbent whereby the TC-II from said quantity of serum becomes adsorbed thereto, and (b) a DEAE-cellulose adsorbent whereby the TC-I and TC-III from said quantity of serum becomes adsorbed thereto; washing away from said adsorbents the ^{57}Co Vitamin B-12 not bound to any of the transcobalamins; measuring the total radioactivity of said adsorbents, which radioactivity is a function of the total unsaturated Vitamin B-12 binding capacity of the serum tested; selectively desorbing TC-III from said DEAE-cellulose by washing with a monopotassium phosphate solution of about 0.05 M and at a pH of about 4.6; measuring the individual radioactivity of said adsorbents, which radioactivity of said TC-II adsorbent is a function of the TC-II unsaturated Vitamin B-12 binding capacity of the serum tested and that of said DEAE-cellulose adsorbent is a function of the TC-I unsaturated Vitamin B-12 binding capacity of the serum tested; and calculating the difference in radioactivity of said total radioactivity measurement and the sum of said individual radioactivity measurements, which difference is a function of the TC-III unsaturated Vitamin B-12 binding capacity of the serum tested.

4,273,758

DENTIFRICE AND ITS METHOD OF MANUFACTURE

Weilin Liau, 73-9,, Aza-Honmachi, Utashinai-shi, Hokkaido, Japan (073-04)

Filed Nov. 6, 1979, Ser. No. 91,817
Int. Cl.[3] A61K *7/16*
U.S. Cl. 424—49 **2 Claims**

1. A method for the manufacture of a dentifrice composition which comprises adding tannic acid to hot water, cooling the mixture, adding glycerine to the cooled mixture, adding the remaining essential ingredients for a dentifrice composition and mixing.

4,273,759

ANTIBACTERIAL ORAL COMPOSITION

Abdul Gaffar, and Maria C. Gaffar, both of Somerset, N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed May 18, 1979, Ser. No. 40,357
Int. Cl.[3] A61K *7/16, 7/20, 7/22*
U.S. Cl. 424—54 **4 Claims**

1. In a method for reducing the amount of dental plaque in the oral cavity comprising applying to the oral cavity an oral composition having a pH of about 4.5 to about 9 and containing an oral vehicle and an effective plaque inhibiting amount of cetylpyridinium chloride or benzethonium chloride antibacterial antiplaque agent whose use has been observed to lead to staining or discoloration of dental surfaces, the improvement comprising including in said composition, as anti-stain additive, an effective stain-inhibiting amount of a peroxydiphosphate salt.

4,273,760

SHAMPOO COMPOSITIONS

F. Theodore Koehler, Plainfield; Albert L. Micchelli, Middletown, and Frank A. Nowak, Jr., Somerville, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Continuation of Ser. No. 9,572, Feb. 5, 1979, abandoned, which is a continuation of Ser. No. 833,281, Sep. 14, 1977, abandoned. This application Sep. 14, 1979, Ser. No. 75,720
Int. Cl.[3] A61K *7/06*
U.S. Cl. 424—70 **7 Claims**

1. A conditioning shampoo composition consisting essentially of an aqueous solution of:

(1) from 0.1 to 10.0%, by weight of the total solution, of a water-soluble acid salt of an aminoalkyl ester of a cationic polymer having a molecular weight of 5,000 to 250,000 and selected from the group consisting of the water-soluble acid salts of aminoalkyl esters of (a) a homopolymer of a homopolymerizable unsaturated carboxylic acid having 3 to 5 carbon atoms; (b) a copolymer of a copolymerizable mixture of unsaturated carboxylic acid having 3 to 5 carbon atoms, and (c) a copolymer formed of (i) an unsaturated carboxylic acid having 3 to 5 carbon atoms and (ii) at least one copolymerizable ethylenically unsaturated comonomer selected from the group consisting of vinyl acetate, vinyl propionate, vinyl methyl ether, vinyl ethyl ether, the C_1–C_8 alkyl esters of maleic and the C_1–C_8 alkyl esters of fumaric acids, an amide of acrylic acid and an

amide of methacrylic acid, C_1–C_{18} alkyl ester of acrylic acid, a C_1–C_{18} alkyl ester of methacrylc acid, a C_2–C_4 hydroxyl-alkyl ester of acrylic acid and a C_2–C_4 hydroxyalkylester of methacrylic acid, wherein the copolymers of group (c) are prepared with at least 50 mole percent of the unsaturated carboxylic acid component (i); and

(2) from 5.0 to 30.0%, by weight active solids, based on the weight of the total solution, of at least one anionic surfactant selected from the group consisting of a higher fatty alcohol sulfate, an alkylaryl sulfonate, an alkali metal higher alkyl sulfosuccinate, and an alkali metal salt of an alkylarylpolyethoxyethanol sulfate or an alkali metal salt of an alkylarylpoly-ethoxyethanol sulfonate,

said shampoo composition being prepared in the absence of an amphoteric surfactant and characterized by depositing the cationic polymer on the hair during use, rendering the hair to be more manageable.

4,273,761
METHOD OF ENHANCING ABSORPTION OF ANTITUMOR AGENT INTO GASTROINTESTINAL TUMOR SITE AND ORALLY ADMINISTRABLE ANTITUMOR COMPOSITIONS THEREFOR

Akira Matsuda, Omiya; Osamu Yoshioka, Yono; Katsutoshi Takahashi, Tokyo; Kooichi Yoshida, Soka, and Hiroshi Ninomiya, Sayama, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 10, 1978, Ser. No. 894,844

Claims priority, application Japan, Apr. 12, 1977, 52-41687; Jul. 14, 1977, 52-83528

Int. Cl.³ A61K *31/78*

U.S. Cl. 424—81 **12 Claims**

1. A peroral antitumor composition containing an effective amount of 5-fluorouracil, a sufficient amount of an alkali metal salt of polyacrylic acid having molecular weight 1,000,000 to 10,000,000 to enhance absorption of said active compound into the gastrointestinal tumor site, and a pharmaceutical adjuvant or adjuvants.

4,273,762
LYOPHILIZATION PROCESS FOR LIVE VIRAL COMPOSITIONS

William J. McAleer, Ambler, and Henry Z. Markus, Wyncote, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 3, 1979, Ser. No. 99,772

Int. Cl.³ A61K *39/12, 39/165*

U.S. Cl. 424—89 **6 Claims**

1. A method for preparing an aqueous live virus composition for subsequent lyophilization comprising

preparing a concentrated virus-diluent composition having a volume substantially less than the volume to which it is to be reconstituted at time of use, wherein the virus-diluent composition contains a phosphate salt which phosphate sal. has been added to the diluent as the final ingredient.

4,273,763
PHARMACEUTICAL AND DIETARY COMPOSITIONS

David F. Horrobin, Montreal, Canada, assignor to Efamol Limited, London, England

Filed Jan. 19, 1979, Ser. No. 4,924

Claims priority, application United Kingdom, Jan. 23, 1978, 2642/78; Feb. 7, 1978, 4921/78; Apr. 19, 1978, 15481/78; Aug. 17, 1978, 33682/78; Oct. 24, 1978, 41761/78

Int. Cl.³ A61K *33/30, 31/54, 31/315, 31/20*

U.S. Cl. 424—145 **17 Claims**

1. A method of treating schizophrenia comprising administering to a person suffering therefrom an effective amount of a β-lactam antibiotic in an acceptable pharmaceutical or dietary vehicle.

4,273,764
STABILIZATION OF 2,2-DIMETHYL-4,5-BENZOSPIRO[2,4]HEPTA-4,6-DIENE-1-CARBOXYLIC ACID, α-CYANO-M-PHENOXYBENZYL ESTER

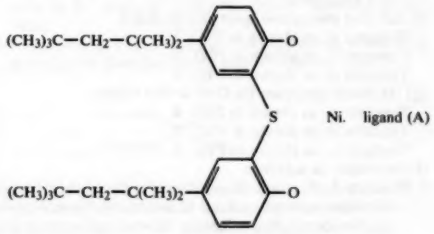
Arnold Zweig, Westport, and Arthur K. Hoffmann, New Canaan, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 685,944, May 13, 1976, which is a continuation-in-part of Ser. No. 470,763, May 17, 1974, abandoned, which is a continuation-in-part of Ser. No. 403,366, Oct. 4, 1973, abandoned. This application Aug. 30, 1979, Ser. No. 70,758

Int. Cl.³ A01N *25/22;* **C07C** *69/74;* **A01N** *37/00;* **C07C** *121/50*

U.S. Cl. 424—174 **6 Claims**

1. A process for stabilizing 2,2-dimethyl-4,5-benzospiro[2,4-]hepta-4,6-diene-1-carboxylic acid, α-cyano-m-phenoxybenzyl ester which comprises adding thereto in an amount to effect stabilization a compound of the formula:



wherein the ligand (a) is an aliphatic primary amine of 4–12 carbon atoms.

4,273,765
AMINO SUGAR DERIVATIVES CONTAINING TREHALOSE

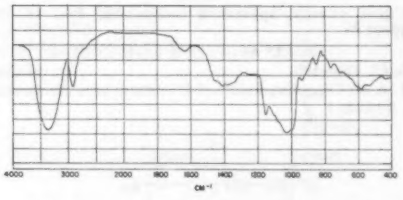
Yasuji Suhara; Kiyoshi Ogawa, both of Yokohama; Kazuteru Yokose, Urayasu, and Kimihiro Watanabe, Ayase, all of Japan, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Feb. 9, 1979, Ser. No. 11,002

Claims priority, application United Kingdom, Feb. 14, 1978, 5834/78

Int. Cl.³ A61K *31/73;* **C07H** *5/06*

U.S. Cl. 424—180 **2 Claims**



1. The novel amino sugar derivatives Trestatin A, Trestatin B and Trestatin C and salts and mixtures thereof having trehalose as a common structural feature and having the following properties:

(a) Elementary analysis:

	C %	H %	N %	O %
Trestatin A:	46.72	7.13	2.08	43.28
Trestatin B:	46.27	7.04	1.65	44.69

-continued

	C %	H %	N %	O %
Trestatin C:	47.55	7.15	2.29	42.66

(b) Molecular weight (Osmometry):
Trestatin A: 1470
Trestatin B: 975
Trestatin C: 1890
(c) Melting point:
Trestatin A: 221°–232° C. (dec.)
Trestatin B: 209°–219° C. (dec.)
Trestatin C: 230°–237° C. (dec.)
(d) Specific rotation:
Trestatin A: $[\alpha]_D^{24} = +177°$ (c=1.0, H_2O)
Trestatin B: $[\alpha]_D^{26} = +187°$ (c=1.0, H_2O)
Trestatin C: $[\alpha]_D^{23} = +169.5°$ (c=1.0, H_2O)
(e) Ulraviolet absorption spectrum (in water):
Each of Trestatin A, Trestatin B and Trestatin C shows end absorption
(f) Infrared absorption spectrum (in KBr):
Trestatin A: as shown in FIG. **1**
Trestatin B: as shown in FIG. **2**
Trestatin C: as shown in FIG. **3**
(g) ^1H NMR spectrum (in D_2O at 100 MHz):
Trestatin A: as shown in FIG. **4**
Trestatin B: as shown in FIG. **5**
Trestatin C: as shown in FIG. **6**
(h) Solubility in solvents:
Trestatin A, Trestatin B and Trestatin C and their hydrochlorides are easily soluble in water; soluble in dimethylsulfoxide; slightly soluble in ethanol and acetone; and insoluble in ethyl acetate and chloroform;
(i) Color reaction:
Each of Trestatin A, Trestatin B and Trestatin C is positive to permanganate and anthrone reactions, and negative to Sakaguchi reaction.

2. Amylase inhibiting compositions containing Trestatin A, Trestatin B or Trestatin C as defined in claim **1**, or a salt of mixtures thereof in admixture with an organic or inorganic inert carrier material suitable for enteral application.

4,273,766
NITROSO-UREA DERIVATIVES

Jaroslav Stanek, Birsfelden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

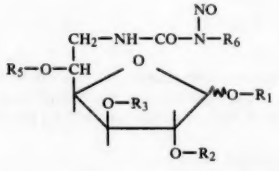
Continuation-in-part of Ser. No. 913,776, Jun. 8, 1978, abandoned, and a continuation-in-part of Ser. No. 14,195, Feb. 22, 1979, abandoned. This application Apr. 12, 1979, Ser. No. 29,495

Claims priority, application Switzerland, Jun. 15, 1977, 7359/77

Int. Cl.[3] **A61K** *31/70;* **C07H** *15/04*

U.S. Cl. 424—180 **14 Claims**

1. A N_1-Glucofuranosid-6-yl-N_3-nitroso-urea compound of the formula I



(I)

wherein anyone of R_1, R_2, R_3 and R_5 represent hydrogen, lower alkyl, lower alkyl substituted by hydroxy, lower alkoxy or halogen, phenyl-lower alkyl or naphthyl-lower alkyl, phenyl-lower alkyl or naphthyl-lower alkyl substituted in the phenyl or naphthyl moiety by lower alkyl, hydroxy, lower alkyl, lower alkylendioxy, halogen or trifluoromethyl, an acyl residue of an organic carboxylic acid having 2 to 18 carbon atoms, a lower alkylsulphonic acid, a phenylsulphonic acid or a lower alkyl-phenylsulphonic acid, or R_1 and R_2 together or R_3 and R_5 together represent also a lower alkylidene or a cycloalkylidene having 5 to 6 carbon atoms, and R_6 represents lower alkyl or lower alkyl substituted by hydroxy, lower alkoxy or halogen.

13. A pharmaceutical preparation useful for inhibition of tumors of Ehrlich's ascitic carcinoma or solid Harding - Passey's melanoma or Yoshida's ascitic sarcoma, or leukaemia L 1210 or Rauscher's leukaemia in mice and rats, which comprises a therapeutically effective amount of a compound claimed in claim **1** and a pharmaceutically acceptable carrier thereof.

14. A method of inhibiting tumors of Ehrlich's ascitic carcinoma, solid Harding–Passey's melanoma or Yoshida's ascitic sarcoma, or leukaemia L 1210 or Rauscher's leukaemia in mice and rats, comprising admistering to said animals a therapeutically effective amount of a compound of claim **1**.

4,273,767
COMBATING PLANT PESTS WITH PHOSPHORYLATED CARBAMOYL COMPOUNDS

Engelbert Kühle, Berg.-Gladbach; Hermann Hagemann, Cologne; Wolfgang Behrenz, Overath; Ingeborg Hammann, Cologne, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

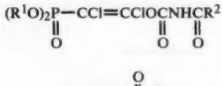
Filed Jan. 9, 1980, Ser. No. 110,585

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1979, 2903592

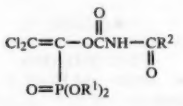
Int. Cl.[3] **A01N** *9/40;* **C07F** *57/20, 57/22*

U.S. Cl. 424—211 **10 Claims**

1. A phosphorylated carbamoyl compound of the formula



or



in which

R^1 represents a lower alkyl radical and

R^2 represents an alkoxy radical with 1–6 C atoms (which can optionally be substituted by halogen, alkoxy, aryloxy, alkylthio or dialkylamino) an alkenoxy or alkynoxy radical with up to 6 C atoms, a cycloalkoxy radical with 5–7 C ring atoms (which can optionally be substituted by lower alkyl), an aralkoxy radical with 7–12 C atoms (which can optionally be substituted by halogen, nitro, akyl, alkoxy or trihalogenomethyl), an aryloxy radical (which can optionally be substituted by halogen, nitro, alkyl alkoxy or trihalogenomethyl), an alkylmercapto, cycloalkylmercapto or aralkylmercapto radical (which can optionally be substituted by alkoxy, alkylmercapto or dialkylamino), an arylmercapto radical (which can optionally be substituted by halogen, nitro, alkyl or trihalogenomethyl), NH_2, a primary or secondary aliphatic, cycloaliphatic or araliphatic amine radical with 1–10 C atoms, an aryl amino radical (which can optionally be substituted by halogen, nitro, alkyl, alkoxy, trihalogenomethyl, trihalogenomethoxy or trihalogenomethylmercapto), or an oximino radical that is derived from an aliphatic, cycloaliphatic, araliphatic or aromatic oxime.

9. A method of combating arthropods or nematodes which comprises applying to the arthropods or nematodes, or to a

habitat thereof, an arthropodicidally or nematicidally effective amount of a compound according to claim 1.

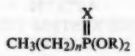
4,273,768

CONTROL OF NEMATODES AND OTHER HELMINTHS

Jan P. Kochansky, Adelphi; Julius Feldmesser, and William E. Robbins, both of Silver Spring, all of Md., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 19, 1980, Ser. No. 151,068
Int. Cl.³ A01N 57/00
U.S. Cl. 424—222 2 Claims

1. A method of controlling nematodes comprising exposing said nematodes to a lethally effective amount of a compound of the formula



wherein n is a number from 5 to 17, X is oxygen or sulfur, and R is one of CH_3,CH_2CH_3,$CH_2CH_2CH_3$, or $(CH_2)_3CH_3$.

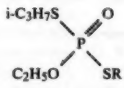
4,273,769

O-ETHYL S-ALKYL S-ISOPROPYL PHOSPHORO-DITHIOLATE, AND THEIR USE AS NEMATOCIDE

Rokuo Koyanagi, Ibaraki; Yoshio Fujita, Kawanishi, and Kunio Mukai, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Apr. 14, 1980, Ser. No. 139,990
Claims priority, application Japan, Apr. 20, 1979, 54-49208
Int. Cl.³ A01N 57/12; C07F 9/165
U.S. Cl. 424—224 5 Claims

1. An O-ethyl S-alkyl S-isopropyl phosphorodithiolate of the formula (I),



(I)

wherein R is methyl or ethyl group.

3. A method for controlling a nematode with a nematocidally effective amount of a compound according to claim 1.

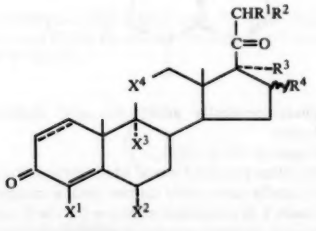
4,273,770

4-HALO STEROIDS

Francisco S. Alvarez, Sunnyvale, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 893,641, Apr. 5, 1978, abandoned. This application Aug. 20, 1979, Ser. No. 67,984
Int. Cl.³ C07J 5/00
U.S. Cl. 424—241 54 Claims

1. A compound chosen from those represented by the formula

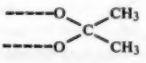


(I)

wherein
X^1 is fluoro or chloro;
X^2 is hydrogen, fluoro or chloro;
X^3 is hydrogen, fluoro, chloro or bromo;
X^4 is =C=O or

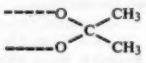
or may be

when X^3 is chloro;
R^1 is hydrogen, fluoro, chloro, bromo, hydroxy or methoxy;
R^2 is fluoro, chloro, bromo, hydroxy or alkanoyloxy of 2 through 6 carbon atoms when R^1 is hydrogen or R^2 is the same as R^1 when R^1 is fluoro, chloro, hydroxy or methoxy;
R^3 is alkanoyloxy of 2 through 6 carbon atoms when R^4 is α-methyl or β-methyl or R^3 and R^4 together are



; and

the solid and broken lines between the 1- and 2-positions in the A ring of the steroid nucleus represents a single or a double bond when R^3 and R^4 together are



; and

and a double bond when R^3 is alkanoyloxy and R^4 is α-methyl or β-methyl.

54. A method of relieving a topical inflammatory condition in a mammal which comprises administering a therapeutically effective amount of the compound of claim 1 to said mammal.

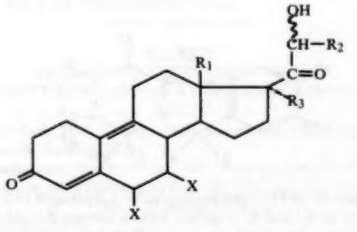
4,273,771

NOVEL $\Delta^{4,9}$-GONADIENE-21-OL-3,20-DIONES

Daniel Coussediere, Montfermeil, France, assignor to Roussel Uclaf, Paris, France

Filed Jul. 5, 1979, Ser. No. 55,019
Claims priority, application France, Jul. 13, 1978, 78 20973
Int. Cl.³ C07J 71/00; A61K 31/56
U.S. Cl. 424—242 24 Claims

1. A $\Delta^{4,9}$-gonadiene-3,20-dione of the formula



wherein X is selected from the group consisting of hydrogen and tritium, R_1 is alkyl of 1 to 3 carbon atoms, R_2 is alkyl of 1 to 12 carbon atoms and R_3 is alkyl of 1 to 4 carbon atoms in the form of 21R or 21S epimers or mixtures thereof.

17. A method of inducing progestomimetic and antiestro-

genic activity in warm-blooded animals comprising administering to warm-blooded animals a progestomimetically and antiestrogenically effective amount of at least one compound of claim 1, wherein X is hydrogen.

4,273,772

METHOD OF REDUCING GASTRIC SECRETION

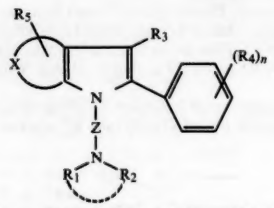
Richard C. Allen, Flemington, N.J., assignor to Hoechst-Roussel Pharmaceuticals, Inc., Bridgewater, N.J.

Filed Aug. 17, 1979, Ser. No. 67,223

Int. Cl.³ A61K *27/00, 31/495, 31/445, 31/40*

U.S. Cl. 424—248.54 **32 Claims**

1. A method of reducing gastric secretion in a mammal which comprises administering to a mammal in need thereof an effective anti-secretory amount of a substituted N-aminoalkylpyrrole having the formula



wherein Z is a straight or branched saturated or olefinically unsaturated hydrocarbon chain of from 2 to 5 carbon atoms; R_1 is hydrogen or alkyl of from 1 to 3 carbon atoms; R_2 is alkyl of from 1 to 3 carbon atoms or phenyl; or R_1 and R_2 together with the nitrogen atom to which they are attached form a heterocyclic selected from the group consisting of pyrrolidinyl, piperidino, piperazinyl, imidazolidonyl and morpholino; R_3 is hydrogen or phenyl or substituted phenyl; R_4 is alkyl of from 1 to 6 carbon atoms; alkoxy of from 1 to 4 carbon atoms; halogen, trifluoromethyl, hydroxy, nitro, cyano, amino, acetamido, phenyl or substituted phenyl; n is an integer from 0 to 3, inclusive; X is alkylene of from 3 to 7 carbon atoms; and R_5 is hydrogen, alkyl of from 1 to 5 carbon atoms, alkoxy of from 1 to 2 carbon atoms or halogen; or a physiological tolerable acid addition salt thereof.

4,273,773

ANTIHYPERTENSIVE TRICYCLIC ISOINDOLE DERIVATIVES

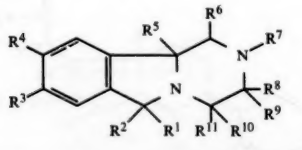
Christopher A. Demerson, Montreal; Leslie G. Humber, Dollard des Ormeaux, and Jean-Marie Ferland, St. Laurent, all of Canada, assignors to American Home Products Corporation, New York, N.Y.

Filed Sep. 24, 1979, Ser. No. 78,547

Int. Cl.³ A61K *31/495;* **C07D** *241/36*

U.S. Cl. 424—250 **52 Claims**

1. A compound of formula Ia



(Ia)

in which R^1 and R^{11} are hydrogen; R^2 is hydrogen or hydroxymethyl; or R^1 and R^2 together form a ketone; R^3 and R^4 each is hydrogen, lower alkoxy, lower alkyl, halo or hydroxy; R^5 is hydrogen, lower alkyl or phenylmethyl; R^6 is hydrogen or lower alkyl; R^7 is hydrogen, lower alkyl, lower alkanoyl, cyclohexylcarbonyl, phenylmethyl, benzoyl, 4-nitrobenzoyl, 4-aminobenzoyl, a radical of formula $(CH_2)_nNR^{12}R^{13}$ wherein n is an integer from two to six, and R^{12} and R^{13} each is lower alkyl, or a radical of formula $CO—(CH_2)_{n-1}NR^{12}R^{13}$ wherein n, R^{12} and R^{13} are as defined herein; R^8, R^9 and R^{10} each is hydrogen or lower alkyl, with the proviso that when R^6 is lower alkyl then R^1, R^2, R^5, R^8 and R^9 are hydrogen or R^1 and R^2 together form a ketone, or a therapeutically acceptable acid addition salt thereof.

48. A method of treating hypertension in a mammal, which comprises administering to said mammal an effective antihypertensive amount of a compound of formula Ia or a therapeutically acceptable acid addition salt thereof, as claimed in claim 1.

4,273,774

CENTRAL NERVOUS SYSTEM COMPOSITIONS AND METHOD

Arthur Scherm, Bad Homburg, Fed. Rep. of Germany, assignor to Merz & Co., Frankfurt, Fed. Rep. of Germany

Filed Dec. 19, 1979, Ser. No. 105,419

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1978, 2856393

Int. Cl.³ A61K *31/52, 31/135*

U.S. Cl. 424—253 **11 Claims**

6. A method for influencing the central nervous system which is especially useful in the treatment of hyperkinesis and rigidity, comprising concurrently administering to a host in need of such treatment the compound (a) 1,3-dimethyl-5-aminoadamantane or a pharmaceutically-acceptable salt thereof and (b) a methylxanthine compound, selected from caffeine and theophylline, in an amount up to about fifteen milligrams of the methylxanthine compound per milligram of the 1,3-dimethyl-5-aminoadamantane compound, the combination of (a) and (b) constituting an effective antihyperkinesic dose.

4,273,775

HYDANTOIN DERIVATIVES, ANTI-DIABETIC COMPOSITIONS THEREOF, AND METHOD OF USE THEREOF

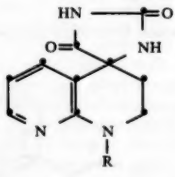
Reinhard Sarges, Mystic, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 48,004, Jun. 13, 1979. This application May 27, 1980, Ser. No. 153,154

Int. Cl.³ C07D *471/20;* **A61K** *31/42*

U.S. Cl. 424—256 **6 Claims**

1. A compound of the formula:



II

and the pharmaceutically acceptable acid addition salts thereof, wherein

R is hydrogen or lower alkyl.

6. A composition suitable for oral administration comprising a pharmaceutically acceptable carrier and a compound as claimed in claim 1 in an amount effective for the treatment of ocular or neuritic diabetes-associated chronic complications.

4,273,776

ANTIBACTERIAL AND ANTIFUNGAL DERIVATIVES OF 3-(1H-IMIDAZOL-1-YL)-2-PROPEN-1-ONES

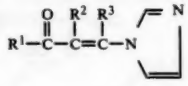
Hans Hoehn, Tegernheim, Fed. Rep. of Germany, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jan. 30, 1980, Ser. No. 117,139

Int. Cl.³ A61K *31/44, 31/415;* **C07D** *233/60, 409/06*

U.S. Cl. 424—263 **7 Claims**

1. A compound of the formula



wherein R^1 is phenyl; substituted phenyl wherein the phenyl group bears one or two halogen, hydroxy, lower alkyl, lower alkoxy, lower alkylthio, cyano or nitro groups; 5- or 6-membered monocyclic aromatic heterocyclic containing one O, S or N atom selected from the group consisting of furan, pyridine and thiophene; or substituted 5- or 6-membered monocyclic aromatic heterocyclic as defined above wherein the heterocyclic bears one halogen, hydroxy, lower alkyl, lower alkylthio, lower alkoxy, cyano or nitro group;

R^2 is halogen,

R^3 is hydrogen, lower alkyl, halogen, phenyl or substituted phenyl wherein the phenyl group bears one halogen, hydroxy, lower alkyl, lower alkoxy, lower alkylthio, cyano or nitro group,

or a physiologically acceptable acid-addition salt thereof.

7. A method for treating bacterial or fungal infections in mammals which comprises administering to a mammalian host an effective amount of a compound as defined in claim **1**.

4,273,777

METHODS OF TREATING MAMMALS SUFFERING FROM INFLAMMATION AND PAIN

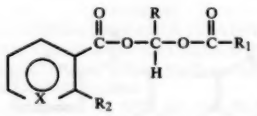
Mario A. Los, Capital Federal, Argentina, assignor to Laboratorios Bago S.A., Argentina

Division of Ser. No. 44,944, Jun. 4, 1979, which is a continuation-in-part of Ser. No. 2,225, Jan. 9, 1979. This application May 13, 1980, Ser. No. 149,435

Int. Cl.³ A61K *31/44*

U.S. Cl. 424—263 **4 Claims**

1. A method of alleviating pain and inflammation in mammals, including humans, suffering from pain and inflammation, which comprises; administering to the mammal an effective amount of a compound selected from those of the formula:



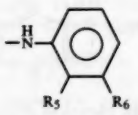
(I)

wherein X represents a moiety of formula:

R taken independently is hydrogen; R_1 taken independently is isobutyl; and R and R_1 when taken together form the divalent moiety of formula:

; and

R_2 is a group of formula:



wherein when R_1 and R are taken together, then R_5 is methyl and R_6 is chlorine, and when R_1 is isobutyl and R is hydrogen, then R_5 is selected from the group consisting of hydrogen and methyl and R_6 is selected from the group consisting of chlorine and trifluoromethyl; and the pharmaceutically acceptable acid addition salts thereof.

4,273,778

PHARMACEUTICALLY ACTIVE AZA-BICYCLO-BENZAMIDE DERIVATIVES

Michael S. Hadley, Sawbridgeworth, and Francis D. King, Newport, both of England, assignors to Beecham Group, Limited, England

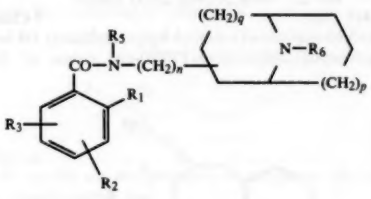
Filed Dec. 26, 1979, Ser. No. 107,413

Claims priority, application United Kingdom, Dec. 30, 1978, 50380/78; Mar. 15, 1979, 09262/79; Aug. 9, 1979, 27831/79

Int. Cl.³ C07D *451/04, 451/14;* **A61K** *31/46, 31/455*

U.S. Cl. 424—265 **41 Claims**

1. A compound of the formula (I) and pharmaceutically acceptable salts thereof:



(I)

wherein:

R_1 is a C_{1-6} alkoxy group;

R_2 and R_3 are the same or different and are hydrogen, halogen, CF_3, C_{2-7} acyl, C_{2-7} acylamino, or amino or aminocarbonyl optionally substituted by one or two C_{1-6} alkyl groups, or nitro;

R_5 is hydrogen or C_{1-6} alkyl;

R_6 is C_{1-7} alkyl or a group $-(CH_2)_sR_7$ where s is 0 to 2 and R_7 is a C_{3-8} cycloalkyl group, or a group $-(CH_2)_tR_8$ where t is 1 or 2 and R_8 is C_{2-5} alkenyl or a phenyl group optionally substituted by one or two substituents selected from C_{1-6} alkyl, C_{1-4} alkoxy, trifluoromethyl and halogen; and

n, p and q are independently 0 to 2.

4,273,779

TREATING HYPERTENSION WITH SUBSTITUTED-5-AMINO-2-PYRIDINECARBOXYLIC ACIDS

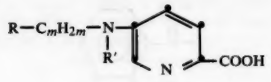
Neville Finch, West Orange, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 753,975, Dec. 15, 1976, abandoned. This application Oct. 17, 1977, Ser. No. 842,846

Int. Cl.² A61K *31/455*

U.S. Cl. 424—266 **3 Claims**

1. A method of treating hypertension in mammals, which comprises administering to said mammals in need of such treatment enterally or parenterally a composition comprising a hypotensively effective amount of a compound of the formula



wherein R is hydrogen, phenyl, or phenyl substituted by up to two members selected from lower alkyl, lower alkoxy, halogeno, trifluoromethyl, cyano, carbamoyl or phenoxy, R′ is hydrogen, lower alkyl or benzyl, m is an integer from 1 to 4, or a therapeutically acceptable ammonium, alkali metal or acid addition salt thereof, together with a pharmaceutical excipient.

4,273,780

ANTI-ALLERGIC ANTI-9,10-DIHYDRO-4-(1-METHYL-4-PIPERIDYLIDENE)-4H-BENZO[4,5]CYCLOHEPTA[1,2-B]THIOPHEN-10(9H)-ONE OXIME

Erwin Waldvogel, Aesch; Jean-Michel Bastian, Therwil, and Gustav Schwarb, Allschwil, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

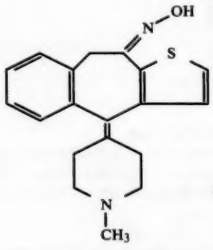
Continuation of Ser. No. 37,720, May 11, 1979, abandoned, which is a continuation of Ser. No. 869,101, Jan. 13, 1978, abandoned, which is a continuation-in-part of Ser. No. 754,984, Dec. 28, 1976, abandoned. This application Jan. 8, 1980, Ser. No. 110,443

Claims priority, application United Kingdom, Jan. 2, 1976, 50/76

Int. Cl.³ A61K *31/445;* **C07D** *409/02*

U.S. Cl. 424—267 **3 Claims**

1. Anti-9,10-dihydro-4-(1-methyl-4-piperidylidene)-4H-benzo[4,5]cyclohepta[1,2-b]thiophen-10(9H)-one oxime of formula,



containing less than 5% of the corresponding syn-isomer.

3. A method of preventing or treating allergic conditions which comprises administering to an animal in need of such treatment an anti-allergic effective amount of the anti-isomer of claim 1.

4,273,781

TREATMENT OF PAIN, FEVER, AND INFLAMMATION WITH COMPOSITIONS CONTAINING PIPERIDINOBUTAN-AND 3-BUTEN-2-ONES

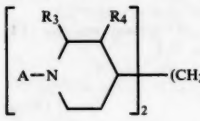
Nathaniel Grier, Englewood; Richard A. Dybas, Somerville, and Bruce E. Witzel, Rahway, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 59,404, Jul. 20, 1979. This application Jul. 17, 1980, Ser. No. 169,566

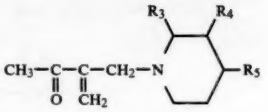
Int. Cl.³ A61K *31/445*

U.S. Cl. 424—267 **6 Claims**

1. A method of treating a condition exhibiting at least one of the symptoms of pain, fever, and inflammation, comprising administering to a patient in need of such treatment a therapeutically effective amount of a compound of the formula:



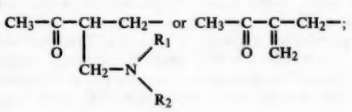
or



wherein

R_1 and R_2 are independently selected from hydrogen; C_{1-8} alkyl; C_{2-8} alkenyl; hydroxy C_{1-8} alkyl; and cyclo C_4-alkyl; or R_1 and R_2 taken together with the nitrogen atom from a five- or six-membered saturated heterocyclic ring substituted at the 2-, 3-, and 4-position with R_3, R_4, and R_5, respectively; and

R_3, R_4, and R_5 are selected from hydrogen; C_{1-3} alkyl; C_{2-3} alkenyl; hydroxy; hydroxy C_{1-3} alkyl; phenyl; carboxyl; carboxamido; C_{1-4} alkyl N-mono- and N,N-disubstituted carbonylamino; C_{1-4} alkoxycarbonyl; 1-pyrrolidinyl; and 1-piperidinyl; A is



and n is 0 to 3; and acid addition and quaternary salts thereof.

4,273,782

INHIBITION OF THROMBOXANE SYNTHETASE BY 3-(1-IMIDAZOLYLALKYL) INDOLES

Peter E. Cross, Canterbury, and Roger P. Dickinson, Dover, both of England, assignors to Pfizer Inc., New York, N.Y.

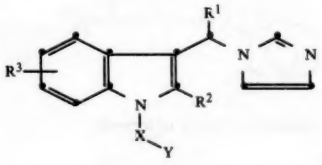
Filed Mar. 5, 1980, Ser. No. 127,298

Claims priority, application United Kingdom, Mar. 7, 1979, 08123/79

Int. Cl.³ A61K *31/415;* **C07D** *403/06*

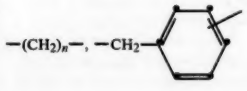
U.S. Cl. 424—273 R **27 Claims**

1. A compound of the formula



(I)

wherein R^1 is hydrogen or C_1–C_4 lower alkyl; R^2 is hydrogen, C_1–C_6 alkyl, C_3–C_6 cycloalkyl, phenyl, or phenyl monosubstituted with C_1–C_4 lower alkyl, C_1–C_4 lower alkoxy, fluorine, chlorine or bromine; R^3 is hydrogen, C_1–C_4 lower alkyl, C_1–C_4 alkoxy, hydroxy, trifluoromethyl, di(C_1–C_4 lower alkyl-)amino, fluorine, chlorine or bromine; X is



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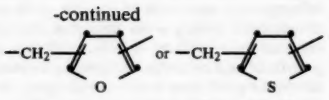
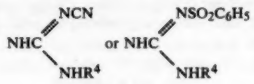


wherein n is an interger of from 1 to 3; Y is CO_2R^4, $CONHR^5$, $CON(C_1–C_4$ lower alkyl$)_2$, CN, 5-tetrazolyl, $CONHCOR^6$, CONHCN or $CONHSO_2R^6$; or, when X is $(CH_2)_n$ and n is 2 or 3, Y is NH_2, $NHCOR^6$, $NHCO_2(C_1–C_4$ lower alkyl), $NHCONHR^5$, $NHSO_2R^6$,



R^4 is hydrogen or $C_1–C_4$ lower alkyl; R^5 is hydrogen, $C_1–C_4$ lower alkyl, $C_3–C_6$ cycloalkyl, phenyl, 2-thiazolyl, 2-pyridyl, 2-pyrazinyl, 2-pyrimidinyl, or 2-pyridazinyl; R^6 is $C_1–C_4$ lower alkyl, $C_3–C_6$ cycloalkyl, 2-pyridyl, phenyl or phenyl monosubstituted with $C_1–C_4$ lower alkyl, $C_1–C_4$ lower alkoxy, fluorine, chlorine or bromine or a pharmaceutically acceptable acid addition salt thereof.

20. A method of inhibiting the action of thromboxane synthetase enzyme in an animal in need of treatment comprising administering to said animal an effective amount of a compound of claim **1**.

4,273,783

(1-ALKYL-5-NITRO-2-IMIDAZOLYL)-VINYL-GLYOXAL-DIACETALS, THEIR PREPARATION AND THEIR USE

Eugen Diethelm, Triesen, Liechtenstein, assignor to Grissman Chemicals Limited, England

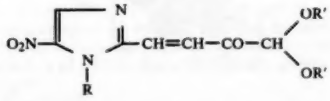
Filed Jun. 18, 1979, Ser. No. 49,313

Claims priority, application United Kingdom, Jun. 22, 1978, 27635/78

Int. Cl.[3] **A61K** *31/415;* **C07D** *233/64*

U.S. Cl. 424—273 R **5 Claims**

1. (1-Alkyl-5-nitro-imidazolyl)-vinyl-glyoxal-diacetal of the formula:



(I)

in which R and R′, which may be the same or different, each represent straight or branched chain alkyl groups of 1 to 5 carbon atoms each.

4,273,784

ORGANIC COMPOUNDS

Pietro Bollinger, Bottmingen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

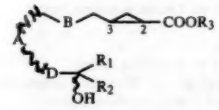
Continuation of Ser. No. 848,814, Nov. 7, 1977, abandoned, which is a continuation of Ser. No. 749,497, Dec. 10, 1976, abandoned, which is a continuation-in-part of Ser. No. 720,315, Sep. 3, 1976, abandoned, and Ser. No. 645,546, Dec. 31, 1975, said ser. No. 720,315 is a continuation-in-part of said Ser. No. 645,546, which is a continuation-in-part of Ser. No. 642,189, Dec. 18, 1975 and Ser. No. 485,310, Jul. 2, 1974, abandoned, said Ser. No. 642,189 is a continuation of said Ser. No. 485,310.

Claims priority, application Switzerland, Jul. 9, 1973, 9959/73; May 4, 1974, 6049/74; Feb. 11, 1975, 1651/75; Sep. 5, 1975, 11593/75; Oct. 1, 1975, 12727/75; Dec. 12, 1975, 16143/75; Dec. 16, 1975, 16281/75; Jan. 7, 1976, 102/76; Jan. 7, 1976, 103/76

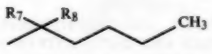
Int. Cl.[3] **C07C** *177/00*

U.S. Cl. 424—305 **41 Claims**

1. A compound of the formula



where R_1 is a radical of formula III,



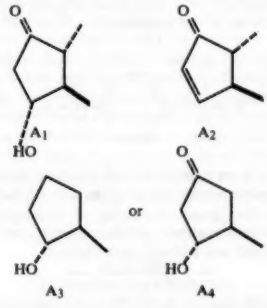
III

wherein

R_7 and R_8 are, independently, hydrogen or alkyl of 1 to 4 carbon atoms, and

R_2 is hydrogen, and

A is a group of the formula



and

B is (cis—CH=CH— and

D is (trans)—CH=CH— and

R_3 is

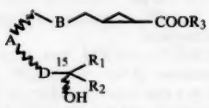
(i) hydrogen

(ii) alkyl of 1 to 8 carbon atoms,

(iii) cycloalkyl of 3 to 10 carbon atoms, or

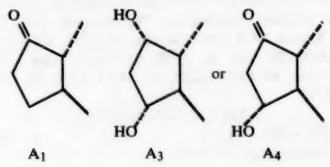
(iv) aralkyl of 7 to 12 carbon atoms.

26. A compound of the formula



wherein

A is a group of the formula



A_1 A_3 A_4

B is (cis)-CH=CH-, and

D is (trans)-CH=CH-, and

R_1 is n-pentyl, and

R_2 is alkyl of 1 to 7 carbon atoms, and

R_3 is

(i) hydrogen,

(ii) alkyl of 1 to 8 carbon atoms

(iii) cycloalkyl of 3 to 10 carbon atoms or

(iv) aralkyl of 7 to 12 carbon atoms.

40. The compound of claim 1 which is (5Z, 11α, 13E, 15S)-11,15-dihydroxy -15-methyl-9-oxo-2,3-(+)-trans-methylene-prosta-5,13-dienoic acid.

4,273,785

BENZALDEHYDES, ALKANOPHENONES, AND BENZOPHENONES AND DERIVATIVES THEREOF CONTAINING A 4-MONOALKYLAMINO GROUP

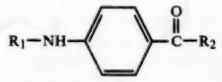
Robert G. Shepherd, South Nyack, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed Sep. 27, 1977, Ser. No. 836,947

Int. Cl.[3] **A61K** *31/135, 31/205;* **C07C** *95/08*

U.S. Cl. 424—316 **17 Claims**

1. The method of treating hyperlipidemia and hyperlipoproteinemia and/or altering the lipoprotein pattern in a mammal comprising administration to said mammal of an effective lipid-altering amount of a compound selected from the group consisting of those of the formula:



wherein R_1 is a straight chain alkyl group of the formula $C_nH_{2n}+1$ wherein n is an integer from 8 to 19, inclusive; R_2 is selected from the group consisting of hydrogen and alkyl having up to 6 carbon atoms; and the pharmaceutically acceptable acid addition and cationic salts thereof.

4,273,786

INHIBITION OF CONDITIONS ARISING FROM MICROBIAL PRODUCTION OF AMMONIA

Kenneth S. Kraskin, Milltown, N.J., assignor to Personal Products Company, Milltown, N.J.

Continuation-in-part of Ser. No. 595,985, Jul. 14, 1975, abandoned, which is a division of Ser. No. 478,663, Jun. 12, 1974, Pat. No. 3,935,862. This application Apr. 13, 1977, Ser. No. 787,238

Int. Cl.[3] **A61K** *31/195*

U.S. Cl. 424—319 **4 Claims**

1. A method for inhibiting the development of odor and inflammatory conditions of the skin in the pelvic area caused by ammonia arising from microbial degradation of urea in excreted urine without significant detrimental effect on the growth of said microbes comprising: contacting the skin surface in the pelvic area with a composition comprising a vehicle suitable for topical application and, as the sole active ingredient, a water-soluble salt of an aminopolycarboxylic acid compound wherein said aminopolycarboxylic acid compound is an acid selected from the group consisting of ethylenediaminetetraacetic acid, diethylenetriaminepentaacetic acid and N-hydroxyethylethylenediaminetriacetic acid; and wherein said water-soluble salt is supplied in an amount to provide a concentration of from about 0.01% to about 5% by weight, based on the weight of said aminopolycarboxylic acid compound in excreted urine.

4,273,787

1-ALKYL,1-PHENYL-BUTENES

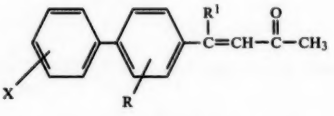
Eugene E. Galantay, Liestal, Switzerland, assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation of Ser. No. 656,785, Feb. 10, 1976, abandoned, which is a continuation-in-part of Ser. No. 626,943, Oct. 29, 1975, abandoned, which is a continuation-in-part of Ser. No. 390,032, Aug. 20, 1973, abandoned. This application Aug. 9, 1979, Ser. No. 65,277

Int. Cl.[3] **C07C** *49/223;* **A01N** *35/00;* **C07C** *49/225;* **A61K** *31/12;* **C07C** *49/217*

U.S. Cl. 424—331 **13 Claims**

1. A compound of the formula



wherein R is a hydrogen atom or halo having an atomic weight of from about 19 to 80;

R^1 is alkyl having from 1 to 3 carbon atoms; and

X is a hydrogen atom, halo having an atomic weight of from about 19 to 80, or alkoxy having from 1 to 4 carbon atoms.

5. A pharmaceutical composition suitable for use as an anti-inflammatory comprising an amount of a compound of claim 1 effective in reducing inflammation and a pharmaceutically acceptable carrier for said compound.

4,273,788

BULK PACKAGED MIXTURE OF HARD AND SOFT PET FOODS

David P. Bone, Palatine, and Lynda Robleski, Skokie, both of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Oct. 19, 1979, Ser. No. 86,549

Int. Cl.[3] **B65B** *23/00, 25/06;* **A23K** *1/00*

U.S. Cl. 426—104 **15 Claims**

1. A bulk packaged pet food product comprising a closed package containing a mixture of discrete pieces of hard dry pet food and soft dry or soft semi-moist pet food, in which the hard dry pet food pieces are roughly spherical bite-size pieces, and

the soft pet food pieces consist essentially of slender cut burger strands, such strands being between 1.4 and three times greater in length than the largest dimension of the dry pet food pieces, the largest transverse dimension of the strands being between about 0.15 and 0.25 times the largest dimension of the hard, bite-size pieces, said large dimension of said bite-size pieces being between 0.5 and 1.0 inches, wherein the soft pieces are present in an amount between 10 and 40 percent by weight of the mixture.

4,273,789

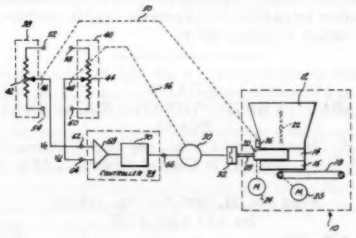
METHOD FOR AUTOMATIC CONTROL OF FOOD FORMING MACHINES

Clifton E. Zimmerman, 13331-178th Ave. SE., Renton, Wash. 98055

Division of Ser. No. 746,403, Dec. 1, 1976, Pat. No. 4,147,485. This application Jan. 19, 1979, Ser. No. 4,937

Int. Cl.³ A22C *7/00*

U.S. Cl. 426—231 **2 Claims**



1. In a process for forming a shapable food substance into a molded food product wherein the food substance is compressed under an adjustable forming pressure that is controlled by a rotatable rod which is rotated in a first direction to increase said forming pressure and rotated in a second direction to decrease said forming pressure, a method of controlling the density of said molded food product comprising the steps of:

sensing the temperature of said food substance being formed into said molded food product and supplying a first electrical signal representative of the temperature of said food substance; and

controlling said adjustable forming pressure as an inverse function of said temperature of said food substance by supplying a second electrical signal representative of the angular position of said rotatable rod, comparing said first and second electrical signals, automatically turning said rotatable rod in said first direction when said first electrical signal is less than said second electrical signal and automatically turning said rotatable rod in said second direction when said first electrical signal is greater than said second electrical signal.

4,273,790

LOW-FAT LIQUID SPREAD AND PROCESS

Peter M. Bosco, Brookfield Center, and William L. Sledzieski, Norwalk, both of Conn., assignors to Standard Brands Incorporated, New York, N.Y.

Filed Nov. 19, 1979, Ser. No. 95,643

Int. Cl.³ A23D *3/00, 5/00*

U.S. Cl. 426—335 **19 Claims**

9. A process for preparing a low-fat spread, which comprises: preparing an oil-in-water emulsion by admixing a dispersed phase comprising from 5 to 40%, based on the weight of the emulsion, of a fat having an SFI profile within the following ranges

50° F.—0-35%

70° F.—0-25%

92° F.—<8%

with a continuous aqueous phase, including a stabilizer, and a emulsifier system comprising a combination of lipophilic emulsifier and a hydrophilic emulsifier, the emulsifier system being present in an amount of from 0.1 to 4.0%, based on the total weight of the spread, and each of the lipophilic and hydrophilic emulsifiers being present at levels of at least 0.025% on the same bases, and the relative and total amounts of the emulsifiers and stabilizer being effective to provide a stable emulsion and a product which is liquid at about 40° F.; and homogenizing the emulsion under conditions effective to form a stable product which is liquid at about 40° F.

4,273,791

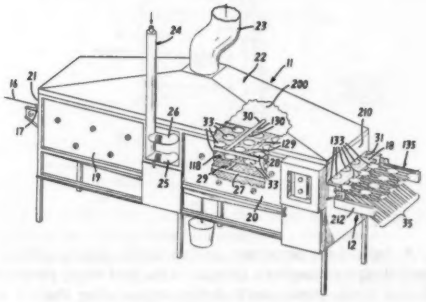
TACO SHELL MANUFACTURING PROCESS FEATURING AGEING TORTILLAS BY TEMPERING FOR RELATIVELY SHORT TIME IN LOW PRESSURE STEAM CHAMBER

Sheldon H. Hanson; Craig B. Thompson, and James E. Olson, all of Stoughton, Wis., assignors to Heublein, Inc., Hartford, Conn.

Division of Ser. No. 822,737, Aug. 8, 1977, Pat. No. 4,197,793. This application Oct. 26, 1979, Ser. No. 88,410

Int. Cl.³ A21D *15/04*

U.S. Cl. 426—439 **3 Claims**



1. A process of making fried taco shells comprising producing masa dough from ground corn; sheeting the dough and cutting disk tortillas therefrom; passing laterally through a heated baking oven on laterally-moving, open web support means, successive, appreciably longitudinally spaced, transverse rows of pluralities of the disk tortillas to transfer equipment for delivering the resultingly baked tortillas in such pattern of relative arrangement to and into the open entrance end of an elongated steam chamber; passing on said transverse rows of said baked tortillas successively through said steam chamber from the entrance end thereof to an outlet end thereof in a time period of about a few seconds to about a few minutes for submission therein to low pressure steam during this period of time to effect tempering in the form of equilibriation of moisture in the baked tortillas; and then transferring said tempered tortillas successively into and through deep fat frying apparatus.

4,273,792

BANANA PROCESSING

William P. Johnson, Queratate, Mexico, and Elton H. Harter, San Jose, Costa Rica, assignors to Gerber Products Company, Fremont, Mich.

Continuation of Ser. No. 958,752, Nov. 8, 1978, abandoned. This application Feb. 25, 1980, Ser. No. 124,152

Int. Cl.³ A23L *1/212*

U.S. Cl. 426—482 **5 Claims**

1. In a process for forming a cooked storage-stable banana puree free of seeds from fresh bananas by the steps of peeling, mashing, and heating, followed by cooling and storing, the improvement comprising accomplishing the heating by sub-

jecting the peeled, mashed bananas to be deseeded to contact with live steam at a temperature greater than the atmospheric boiling temperature of water for a time sufficient to accomplish cooking of the mashed bananas and thereafter subjecting the resulting cooked mashed bananas to flashing in a finisher having a screen so as to form a puree free of discoloration and substantially free of seeds, peel rag and other naturally occurring fibrous materials, said puree then being cooled prior to storing.

4,273,793

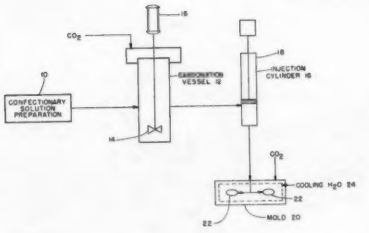
APPARATUS AND PROCESS FOR THE PREPARATION OF GASIFIED CONFECTIONARIES BY PRESSURIZED INJECTION MOLDING

Harry F. Fariel, Suffern, N.Y.; Marvin J. Rudolph, Bethel; Richard B. Hynson, New Fairfield, both of Conn.; Dilip K. Roy, Yorktown, and Fredric Kleiner, New City, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Oct. 26, 1979, Ser. No. 88,485

Int. Cl.³ A23L *1/07;* **A23G** *3/12;* **A23P** *1/00;* **B29D** *27/00*

U.S. Cl. 426—572 **21 Claims**



1. A method for preparing gasified candy, having gas entrained at superatmospheric pressure in the final candy product such that as the candy melts during consumption thereof it releases the gas to produce a tingling popping effect in the mouth, by pressurized injection in a mold, comprising:

a. preparing a confectionary solution;

b. subjecting the confectionary solution to a superatmospheric gas pressure in a pressurized vessel for a sufficient length of time to cause absorption of an amount of gas into the solution;

c. pressurizing an injection mold at a superatmospheric pressure;

d. injecting the gasified confectionary solution into said superatmospherically pressurized injection mold at a pressure above the superatmospheric gas pressure utilized in said pressurizing vessel and;

e. allowing the confectionary solution to solidify in the mold to entrain therein gas at a superatmospheric pressure in the resultant candy product, whereby as the candy melts during consumption it releases the gas to produce a tingling popping effect in the mouth.

4,273,794

COMPOSITION CONTAINING HONEY

Georg von Stering-Krugheim, Bendestorf, Fed. Rep. of Germany, assignor to E.R.E. Europe Representation Establishment, Vaduz, Liechtenstein

Filed Oct. 3, 1979, Ser. No. 81,329

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1978, 2845570

Int. Cl.³ A23L *2/38, 1/08*

U.S. Cl. 426—590 **9 Claims**

1. A composition comprising honey, 0.8 to 2 g of levorotatory ascorbic acid and 15 to 50 g of citric acid per kilogram of honey.

4,273,795

LOW-FAT SPREAD AND PROCESS

Peter M. Bosco, Brookfield Center, and William L. Sledzieski, Norwalk, both of Conn., assignors to Standard Brands Incorporated, New York, N.Y.

Filed Nov. 19, 1979, Ser. No. 95,644

Int. Cl.³ A23D *3/00, 5/00*

U.S. Cl. 426—602 **30 Claims**

1. A low-fat spread comprising: a dispersed phase comprising from 5 to 40%, based on the weight of the spread, of fat having an SFI profile with the following ranges

50° F.—40–80%

70° F.—25–50%

92° F.—< 10%

a continuous aqueous phase including a stabilizer; and an emulsifier system comprising a combination of a lipophilic emulsifier and a hydrophilic emulsifier, the emulsifier system being present in an amount of from 0.3 to 4.0%, based on the total weight of the spread, and each of the lipophilic and hydrophilic emulsifiers are present at levels of at least 0.05% on the same basis; the relative and total amounts of the emulsifiers and the stabilizer being effective to provide a stable emulsion and a product which is solid at 40° F.

4,273,796

PREPARATION OF DEHYDRATED SUGAR TREATED BEANS

Thomas A. Maxcy, Lincoln, Nebr., and John S. Denny, Minneapolis, Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Filed Jan. 21, 1980, Ser. No. 113,833

Int. Cl.³ A23L *1/20*

U.S. Cl. 426—634 **8 Claims**

1. A method of preparing precooked dried leguminous beans, consisting essentially of the steps of:

A. cooking leguminous beans in an aqueous solution of from about 5% to 7% by weight sugar from about 30 minutes to 3 hours until the leguminous beans are from about 62% to 70% by weight water at from about 180° F. to 350° F.; and, thereafter;

B. dehydrating leguminous beans to form dried legumes having a moisture content of from about 4% to 12% by weight.

4,273,797

METHOD OF DETECTING PINHOLES IN A MAGNETIC RECORDING MEDIUM

Goro Akashi; Yasuyuki Yamada; Masaaki Fujiyama, and Nobutaka Yamaguchi, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 835,662, Sep. 22, 1977, abandoned, which is a continuation of Ser. No. 364,264, May 29, 1973, abandoned. This application Apr. 16, 1979, Ser. No. 30,538

Claims priority, application Japan, Jun. 2, 1972, 47/55476

Int. Cl.³ B05D *5/12*

U.S. Cl. 427—10 **6 Claims**

1. A method of detecting pinholes in the magnetic recording layer of a magnetic recording medium where said medium comprises a plastic film having on one side said magnetic recording layer and, on the opposite side, a backing layer containing (1) a light colored powder selected from the group consisting of ZnO and TiO_2 and mixtures thereof, (2) a further substance selected from the group consisting of carbon black, graphite and mixtures thereof in an amount of about 3 to about 30 parts by weight based on 100 parts by weight of said powder; and (3) a polymeric binder, said light colored powder and said further substance being present in an amount of from about 80 to 600 parts by mixed weight, based on 100 parts by weight of said binder, said backing layer being from 0.5 to 5 microns in dry thickness and transmitting more than 3% of white light at a thickness of 2 microns and said backing layer having a surface electrical resistance of less than $10^{10}\Omega/cm^2$,

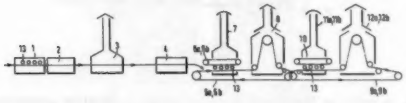
said method comprising transmitting light through said recording medium so that said pinholes can be detected.

4,273,798

PROCESS FOR COATING METAL TUBES WITH PLASTIC MATERIALS

Werner Scheiber, Frankfurt am Main, Fed. Rep. of Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 29, 1979, Ser. No. 53,654
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1978, 2830593
Int. Cl.³ B05D 1/06, 7/22
U.S. Cl. 427—27 1 Claim



1. In a process of applying a coating of plastic material to both the inside surface and the outside surface of a metal tube of finite length wherein the metal tube is by means of a plurality of successively disposed, horizontally extending carrying conveyors which contact and support said tube in different locations, passed in a direction of travel such that its longitudinal axis is perpendicular to said direction of travel the improvement wherein the metal tube is coated according to the following sequence of process steps:

(A) The metal tube is heated to a temperature above the melting point of the plastic material to be applied thereto,

(B) the plastic material in the form of a powder is together with air applied to the so-heated metal tube on the inside surface thereof and said plastic material is fritted onto said inside surface.

(C) said metal tube is then rotated and subsequently coated on the outside surface thereof except for its end portion which are supported by said conveyor in a plurality of steps with plastic material sprayed thereon by an electrostatic spray process, and

(D) thereafter the end portions are coated with a plastic material by an electrostatic spray process while said tube is supported by said conveyor in a different location, and

(E) after each stage in which the plastic material is applied to the outside surface of the tube and at the stage wherein the plastic material is applied to the end portions of the tube, the tube is heated to melt and cure the plastic material applied to the outside surface or end portion and the plastic material which had been applied to the corresponding area of the inside surface.

4,273,799

METHOD FOR PRODUCING A SYNTHETIC RESIN MOLDED PRODUCT HAVING AN ABRASION RESISTANT SURFACE

Kazumasa Kamada; Kenji Kushi, both of Ohtake; Keisuke Yoshihara, Yokohama, and Hideo Nakamoto, Nagoya, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Division of Ser. No. 878,830, Feb. 17, 1978, Pat. No. 4,199,421.
This application May 2, 1979, Ser. No. 35,401
Claims priority, application Japan, Feb. 23, 1977, 52-19038
The portion of the term of this patent subsequent to Apr. 22, 1997, has been disclaimed.
Int. Cl.³ B05D 3/06
U.S. Cl. 427—44 22 Claims

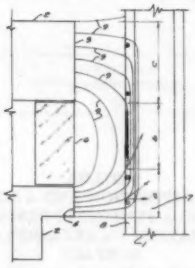
1. A coating composition which comprises 100 parts by weight of a monomer mixture (A) comprising 30–98% by weight of a polyfunctional monomer having at least three substituents selected from the group consisting of acryloyloxy groups and methacryloyloxy groups in one molecule and 70–2% by weight of at least one monomer selected from the group consisting of methoxyethyl (meth)acrylate, ethoxyethyl (meth)acrylate, butoxyethyl (meth)acrylate, methoxydiethylene glycol (meth)acrylate and dipropylene glycol mono(meth-)acrylate and 0–10 parts by weight of a photosensitizer and which can form a crosslinked hardened film excellent in abrasion resistance upon irradiation with actinic radiation in an air atmosphere.

4,273,800

COATING MASS CONTROL USING MAGNETIC FIELD

Paul Reid, New Lambton, Australia, assignor to John Lysaght (Australia) Limited, Australia

Filed Nov. 24, 1978, Ser. No. 963,239
Claims priority, application Australia, Nov. 24, 1977, PD 2536
Int. Cl.³ B05D 3/14
U.S. Cl. 427—47 10 Claims



1. A method for controlling the thickness of a liquid metal coating on a metal substrate comprising the steps of:

advancing said substrate in an advance direction;

disposing a magnetic yoke having two spaced apart pole faces so that each pole face is adjacent the substrate and on the same side thereof with respect to the advance direction;

generating in said magnetic yoke a pulsating or alternating magnetic flux to produce flux in a looped path which enters said coating at an entry zone, passes along one surface of said coating and said substrate, and exits from said coating at an exit zone, said zones both being on the external surface of said one surface of said coating and spaced apart with respect to said advance direction; and

controlling the frequency and intensity of said flux so as to exert on said coating surface a force which opposes viscous drag forces exerted therein by said moving substrate.

4,273,801

PASSIVE BUBBLE GENERATOR

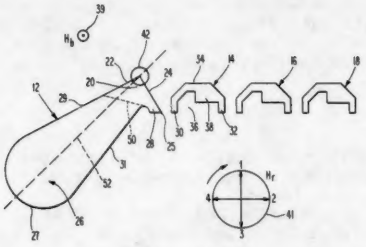
William D. Doyle, Dresher, Pa., assignor to Sperry Corporation, New York, N.Y.

Filed Aug. 1, 1979, Ser. No. 62,842
Int. Cl.³ B05D 3/14
U.S. Cl. 427—48 5 Claims

1. In a method for controllably generating magnetic bubbles in a planar layer of material in which said bubbles exist in stable form when said layer is in the presence of a bias field of a predetermined value and oriented substantially perpendicular to said layer, and on which is present a pattern of permalloy elements defining a path along which said bubbles can move in response to a rotating magnetic field, which magnetic field rotates in the plane of said layer of material, the improvement comprising the steps of:

(a) providing a nucleating permalloy element with a nucleating angle portion and a contiguous area portion larger than the area of said angle portion; and

(b) passively nucleating material bubbles by pulsing said in-plane rotating magnetic field when said field is at a



predetermined orientation with respect to said nucleating angle portion.

4,273,802

COATING COMPOSITION AND A METHOD FOR PRODUCING A SYNTHETIC RESIN MOLDED PRODUCT HAVING AN ABRASION RESISTANT SURFACE

Kazumasa Kamada; Kenji Kushi, both of Ohtake; Keisuke Yoshihara, Yokohama, and Hideo Nakamoto, Nagoya, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

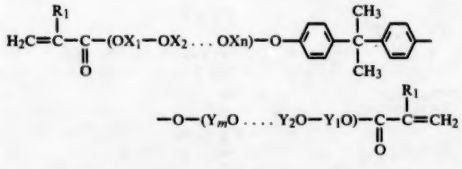
Division of Ser. No. 878,830, Feb. 17, 1978, Pat. No. 4,199,421. This application May 2, 1979, Ser. No. 35,398

Claims priority, application Japan, Feb. 23, 1977, 52/19038

Int. Cl.³ B05D *3/06*; C08F *2/46, 8/00*

U.S. Cl. 427—54.1 **27 Claims**

13. A method for producing an abrasion resistant synthetic resin molded product, which comprises coating on the surface of a synthetic resin molded product a coating composition which comprises 100 parts by weight of a monomer mixture (A) comprising 30–98% by weight of a polyfunctional monomer having at least three groups selected from acryloyloxy group and methacryloyloxy group in one molecule and 70–2% by weight of a monomer having two groups selected from acryloyloxy group and methacryloyloxy group and 0–10 parts by weight of a photosensitizer and which can form a crosslink-hardened film excellent in abrasion resistance by irradiation with actinic radiation in an air atmosphere and then irradiating the coating film with actinic radiation to form a crosslink-hardened flim of 1–30μ thick on the surface of the synthetic resin molded product, wherein said monomer having said two groups has the formula:



(wherein R_1 is hydrogen atom or methyl, X_1, X_2 . . . Xn and Y_1, Y_2 . . . Ym are the same or different alkylene groups of not more than six carbon atoms or those in which one hydrogen atom is substituted with hydroxyl group, and n and m are integers of 0–5).

4,273,803

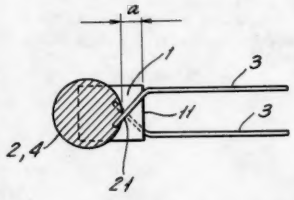
PROCESS FOR COVERING OR COATING ELECTRICAL COMPONENTS

Kurt Jöhnk, Neustadt, Fed. Rep. of Germany, assignor to Dralo-ric Electronic GmbH, Fed. Rep. of Germany

Filed Jul. 2, 1979, Ser. No. 53,910

Int. Cl.³ B05D *5/12*

U.S. Cl. 427—58 **10 Claims**



1. A process for covering or coating an electric component having leads extending away from and beyond an edge of the electric component, comprising the steps of:

wetting the electric component with a solvent;

thereafter directing a jet of insulative liquid covering material against a surface of the electric component, the jet of liquid covering material having a peripheral edge parallel to the direction of motion of the covering material in the jet; the jet of covering material being so directed that the portion of the peripheral edge of the jet that is nearest the edge of the electric component beyond which the leads extend impinges upon the surface receiving the jet of covering material and is spaced approximately a predetermined distance from the edge of the electric component beyond which the leads extend.

4,273,804

PROCESS USING ACTIVATED ELECTROLESS PLATING CATALYSTS

Nathan Feldstein, 63 Hemlock Cir., Princeton, N.J. 08540

Division of Ser. No. 941,044, Sep. 11, 1978, Pat. No. 4,180,600, which is a continuation-in-part of Ser. No. 820,904, Jan. 1, 1977, Pat. No. 4,131,699, which is a continuation of Ser. No. 625,326, Oct. 23, 1975, Pat. No. 4,048,354. This application Dec. 21, 1979, Ser. No. 105,865

The portion of the term of this patent subsequent to Sep. 13, 1994, has been disclaimed.

Int. Cl.³ C23C *3/02*

U.S. Cl. 427—97 **20 Claims**

1. A process for the electroless or chemical plating of a non-conductor substrate comprising the steps;

(1) etching said substrate,

(2) contacting said substrate with an activated colloidal dispersion wherein said colloidal dispersion comprises a metal which in one of its oxidation states is capable of electroless or chemical plating initiation, and wherein said metal may be in an elemental state, or an alloy, or compound, and mixtures thereof and further wherein said activated colloidal dispersion comprises at least one primary stabilizer which alone renders the colloidal dispersion weakly active and at least one reactivity modifier and wherein said primary stabilizer and said reactivity modifier are inherently colloid stabilizers however they are different materials, and

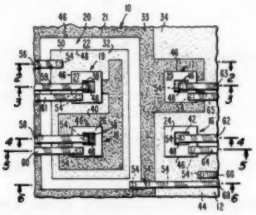
(3) contacting the treated substrate with a compatible electroless plating bath for the deposition of a metal.

4,273,805

PASSIVATING COMPOSITE FOR A SEMICONDUCTOR DEVICE COMPRISING A SILICON NITRIDE (SI_3N_4) LAYER AND PHOSPHOSILICATE GLASS (PSG) LAYER

Robert H. Dawson, Princeton, N.J., and George L. Schnable, Lansdale, Pa., assignors to RCA Corporation, New York, N.Y.

Filed Jun. 19, 1978, Ser. No. 917,106
Int. Cl.³ H01L 7/44
U.S. Cl. 427—88 **8 Claims**



1. An improved method of passivating an integrated circuit device of the type comprising a substrate of semiconductor material having semiconductor devices formed therein, said semiconductor devices being covered by a first layer of insulating material, the improvement comprising the steps of:

(a) forming contact openings through said first layer of insulating material;

(b) covering said first layer of insulating material which an impervious layer of silicon nitride; then

(c) covering said impervious layer with a phosphosilicate glass layer; then

(d) forming contact openings through said phosphosilicate glass layer which align with said contact openings formed through said first layer of insulating material; then

(e) heating said phosphosilicate glass layer in the presence of steam at a temperature sufficient to cause the edges of said contact openings formed in said phosphosilicate glass layer to become rounded, said temperature not being sufficient to affect said impervious layer; then

(f) extending said contact openings through those portions of said impervious layer which are exposed through the contact openings formed in the phosphosilicate glass layer; and

(g) applying a metal over the surface of said phosphosilicate glass layer, whereby said metal will extend through said contact openings to make electrical contact to underlying portions of the semiconductor material which are exposed through said contact openings.

4,273,806

METHOD OF FORMING ELECTRICAL INSULATION BY EXTRUDING POLYMERIC COMPOSITIONS CONTAINING HOLLOW MICROSPHERES

Bernard G. Stechler, 766 Brady Ave., Bronx, N.Y. 10462

Continuation of Ser. No. 892,780, Apr. 3, 1978, abandoned, which is a continuation of Ser. No. 780,231, Mar. 22, 1977, abandoned, which is a division of Ser. No. 709,877, Jul. 29, 1976, abandoned. This application Oct. 15, 1979, Ser. No. 84,637
Int. Cl.³ B05D 5/12
U.S. Cl. 427—119 **1 Claim**

1. In a method of forming electrical insulation about a wire conductor by passing said wire conductor through a bath of a thermoplastic resin whereby said resin adheres to and forms a coating around said wire and pulling the resin coated wire through a circular die of an extruder while allowing the polymeric resin to solidify by cooling down in the ambient atmosphere, whereby the coated wire is pulled through the circular die at a rate equivalent to the cooling down rate of the polymeric resin, the improvement comprising using as said thermoplastic polymeric resin the composition comprising a uniform mixture of a thermoplastic polymeric material which is selected from the group consisting of polyethylene, polypropylene and polyvinyl chloride resin and, as a filler, from 5 to 50 percent by volume of inert silica-alumina, hollow, microspheres ranging from about 5 to about 300 microns in diameter and further characterized by a specific gravity of from about 0.35 to about 0.7; a true particle density of from about 0.4 to about 0.6 grams per cubic centimeter; a bulk density of from about 11 to 25 pounds per cubic foot; a melting point of 1200° C.; a MOH's particles hardness of about 5; a shell thickness which is about 10 percent of the particle radius; and a composition which includes from about 55–60 percent by weight silica (SiO_2); 30–35 percent by weight alumina (Al_2O_3); 4–10 percent by weight iron oxide (Fe_2O_3); and about 1–3 percent by weight of alkali and alkaline earth metals or their oxides, wherein the relationship between the operating pressure in the extruder and temperature increase (ΔT) and the volume percent of the hollow microsphere filler particles is expressed in terms of the following table:

Volume (%) of Microspheres	Extrusion Operating Pressure (psi)	ΔT (°C.)
5–20	1600	80
25	1550	90
30	1500	100
35	1430	110
40	1350	120
45	1210	140
50	1100	150

wherein ΔT represents the difference between the temperature of the polymer resin in the extruder and the polymer temperature before it enters the extruder, the minimum diameter of said die being not less than one-sixteenth inch.

4,273,807

ACICULAR α-IRON PARTICLES AND RECORDING MEDIA EMPLOYING SAME

Kenneth L. Berry, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 21,811, Mar. 19, 1979, Pat. No. 4,207,092, which is a continuation-in-part of Ser. No. 774,138, Mar. 3, 1977, abandoned. This application Nov. 16, 1979, Ser. No. 95,072
Int. Cl.³ B05D 5/12
U.S. Cl. 427—132 **5 Claims**

1. Particulate product containing at least 75 weight % iron (total iron content) and at least 25 weight % acicular α-iron metal, said particulate product having a length less than 1μ, a length to diameter ratio of at least 10:1, a coercivity (iH_c) of greater than 800 oersteds, a saturation magnetization (σ_s) of at least 110 emu/g, a residual magnetization (σ_r) of at least 50 emu/g and a ratio of σ_r/σ_s of at least about 0.45.

4. Magnetic recording medium comprising a magnetizable layer carried on a nonmagnetizable support, the magnetizable layer comprising a non-magnetizable organic polymeric binder material having uniformly dispersed therein finely divided acicular ferromagnetic particles, said recording medium characterized in that the ferromagnetic particles are comprised of the particulate product of claim 1.

4,273,808

PROCESS FOR THE INSULATION OF ORIGINAL PAINT LAYERS

Albert Neirynck, L'Isle-Adam, and Roger Duflos, Viarmes, both of France, assignors to Societe Francaise Duco, Puteaux, France

Filed Aug. 27, 1979, Ser. No. 70,108
Claims priority, application France, Aug. 29, 1978, 78 24910
Int. Cl.[3] B32B *35/00*
U.S. Cl. 427—142 7 Claims

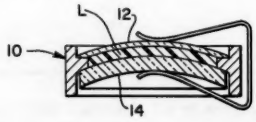
1. Process for the repair of original paint layers, particularly on vehicle bodies, comprising applying on the original paint to be repaired a layer of a liquid film forming composition comprising a dicarboxylic acid- and diamine-based polyamide resin dissolved in a solvent selected from alcohols and water-alcohol mixtures, allowing the resulting protective layer to dry, and then applying thereon the new paint used for the repair.

4,273,809

METHOD OF PREPARING CAST RESIN LENSES

Norman U. LaLiberte, Woodstock, Conn., and Don H. Rotenberg, Westboro, Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Oct. 25, 1979, Ser. No. 88,318
Int. Cl.[3] B05D *7/02, 5/06*
U.S. Cl. 427—155 9 Claims



1. The method of making a post-cured cast resin lens comprising the steps of:

casting an allyl diglycol carbonate resin in a mold to the shape desired of said lens;

partially curing said resin in said mold to produce a lens body;

removing the partially cured lens body from said mold;

coating the partially cured lens body with a readily removable material which is impervious to oxygen;

exposing the coated lens body to a post-curing temperature above room temperature until substantially complete polymerization of all portions and surfaces of said lens body beneath said coating takes place; and

removing the aforesaid coating for exposure and use of the post-cured lens which features high surface cure and abrasion resistance.

4,273,810

METHOD FOR PREVENTING SINTERING IN FORGING BLOCKS

Erwin Dötsch, Dortmund; Jürgen Pötschke, Essen, and Ottmar Knacke, Aachen-Verlautenheide, all of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

Filed Jul. 13, 1979, Ser. No. 57,312
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1978, 2830921
Int. Cl.[3] B21J *1/06*
U.S. Cl. 427—156 7 Claims

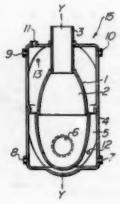
1. Method for preventing lined-up work pieces of iron or iron alloys in a heating zone, the surfaces of which touch each other at elevated temperature and simultaneously under mechanical pressure, from sticking together, which comprises applying a finely-divided material of predominantly iron oxide, directly to the touching surfaces of the work pieces.

4,273,811

METHOD OF APPLYING SLIP TO INTERIOR SURFACES OF A CLOSED TANK TO PROVIDE AN ENAMEL COATING

Joji Okamoto; Hitoshi Azuma; Katsushi Arai; Takemi Naito, all of Yanai; Seiji Kawai, Yamaguchi, and Minoru Goto, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 27, 1977, Ser. No. 836,951
Claims priority, application Japan, Oct. 8, 1976, 51-120357
Int. Cl.[3] G01N *33/02*
U.S. Cl. 427—232 16 Claims



1. A method of applying slip to interior surfaces of a closed tank to provide an enamel coating thereon, comprising the steps of:

(a) introducing the slip for forming the enamel coating into the interior of the closed tank in an amount that is larger than that actually required for forming the enamel coating but smaller than the internal volume of the tank, said slip having a particle size, specific gravity and viscosity preselected to provide said enamel coating;

(b) immediately after the introduction of slip into the tank, introducing pressurized air into said closed tank;

(c) applying slip to an interior surface of the tank during rotation of said tank whereby the rate at which the slip flows across the interior surface of the tank being coated results in an enamel coating of a desired thickness; and

(d) forcibly draining from the tank that excess slip which has not been applied to the interior surface of the tank by the pressurized gases introduced into said tank, said excess slip being drained from the tank at a rate which results in an enamel coating on an interior surface of the tank of a desired thickness.

4,273,812

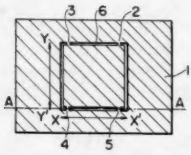
METHOD OF PRODUCING MATERIAL PATTERNS BY EVAPORATING MATERIAL THROUGH A PERFORATED MASK HAVING A REINFORCING BRIDGE

Ken Tsutsui, Hachioji; Akira Sasano, Hinodemachi; Toshio Nakano, Hinodemachi; Haruo Matsumaru, Hinodemachi, and Eiichi Maruyama, Kodaira, all of Japan, assignors to Hitachi, Ltd. and Hitachi Denshi Kabushiki Kaisha, both of Tokyo, Japan

Filed Feb. 1, 1979, Ser. No. 8,587
Claims priority, application Japan, Feb. 1, 1978, 53/9263
Int. Cl.[3] H05K *3/10*; C23C *13/00, 13/02*
U.S. Cl. 427—248.1 17 Claims

1. A method of producing material patterns on a substrate, by deposition of the material in evaporated form through a perforated mask onto the substrate surface, said perforated mask having at least one opening, which at least one opening corresponds to said material patterns, and at least one reinforcing bridge which extends across part of said at least one opening to reinforce said mask, characterized in that during the deposition said perforated mask is spaced from the substrate surface, and further characterized in that the step of depositing the material includes orienting the mask-substrate combination, relative to at least one evaporation source, such that the material is evaporated onto the substrate from at least two

different directions chosen so that no gap is left in the material deposited on the substrate surface beneath the at least one



reinforcing bridge after the deposition, whereby said material patterns, having no gap on the substrate surface beneath the at least one reinforcing bridge, are formed.

4,273,813

METHOD OF PROVIDING WATERPROOF COATING FOR MASONRY WALLS

Michael D. Meddaugh, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed May 19, 1980, Ser. No. 150,867
Int. Cl.³ B05D *3/02*
U.S. Cl. 427—387 **6 Claims**

1. A method of waterproofing a masonry wall to prevent liquid water from passing through the wall, said masonry wall having at least two surfaces, an inner surface and an outer surface, said outer surface being in a location which allows exposure to hydrostatic pressure from ground and surface liquid water, said method comprising

(I) coating said inner surface with an elastomeric silicone emulsion consisting essentially of 100 parts by weight of an anionically stabilized, hydroxyl endblocked polydiorganosiloxane in the form of an aqueous emulsion, greater than 1 part by weight of amorphous silica, and an organic tin salt, the elastomeric silicone emulsion having a pH of 9 or greater and having a solids content of greater than 35 percent by weight and

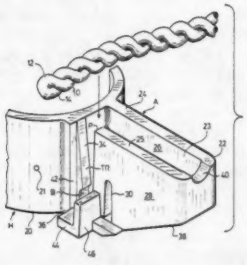
(II) drying the elastomeric silicone emulsion coated inner surface.

4,273,814

ARTIFICIAL SHRUBS OF IMPROVED CONSTRUCTION

Rudolph A. Koehler, Willowdale, Canada, assignor to Noma Lites Canada Limited, Scarborough, Canada

Filed Nov. 5, 1979, Ser. No. 91,097
Int. Cl.³ A47G *33/06*
U.S. Cl. 428—8 **21 Claims**



1. A holder for artificial branches of an artificial shrub or the like, said holder comprising:

a central support element;

a support arm extending outwardly from said central support element and joined thereto, said arm providing a slot in which one of said branches is swingable in a plane between one position in which it is generally aligned with said central support element and another position in which it is outspread therefrom;

a bearing adjacent the juncture of the central support element and said support arm for a pivot element at the end of a said branch and in which said pivot element is receivable and rotatable to permit swinging of the branch in said slot between its two positions aforesaid;

a passageway providing the entrance for said pivot element into said bearing;

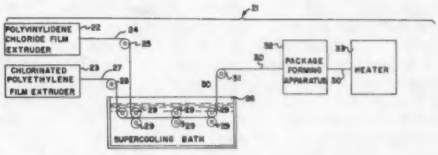
a trap in said passageway which is yieldable to permit insertion of said pivot element into said bearing and resistant to the withdrawal of said pivot element from said bearing.

4,273,815

LAMINATED FILM PACKAGES

Maurice J. Gifford; Oscar E. Seiferth, and Paul E. Grindrod, all of Madison, Wis., assignors to Oscar Mayer & Co. Inc., Madison, Wis.

Division of Ser. No. 48,929, Jun. 19, 1970, Pat. No. 3,698,979, which is a continuation of Ser. No. 612,964, Jan. 31, 1967, abandoned. This application Mar. 16, 1972, Ser. No. 235,291
Int. Cl.³ B32B *27/08, 27/10*
U.S. Cl. 428—35 **8 Claims**



1. A package comprising a product enclosed between first and second sheets of packaging material, said first and second sheets having respective first and second seal forming surfaces which are releasably adhered to each other without an adhesive layer therebetween to define a hermetic seal area which can be readily separated when access to said product is desired and being reclosable for effective resealing after access to said product has been obtained, at least said first sheet being a laminated film in which a polyvinylidene chloride film is adhered to a chlorinated polyethylene film having a chlorine content in the range of 30% to 60% by weight, said chlorinated polyethylene film being the seal forming surface of said sheet.

4,273,816

FOAM BASED STRUCTURE

Henry B. Tollette, Sacramento, Calif., assignor to Custom Made Packaging Inc., Sacramento, Calif.

Filed Jul. 30, 1979, Ser. No. 61,801
Int. Cl.³ B32B *1/02, 5/18, 7/06, 7/10*
U.S. Cl. 428—35 **20 Claims**

20. A container having a printed indicia thereon comprising a foam container, having a layer of paper adhered to said foam

container, and a layer of reverse printed film adhesed at least to said paper.

4,273,817

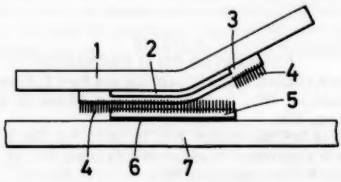
HEAT-TRANSFERRABLE APPLIQUE

Mototsugu Matsuo, 4-36, Nishi 2-chome, Nakazaki, Kita-ku, Osaka-shi, Osaka-fu, and Kazuo Otomine, 533, Sanjo-cho, Takamatsu-shi, Kagawa-ken, both of Japan

Filed Jun. 29, 1979, Ser. No. 53,201

Int. Cl.³ B44C *3/02*

U.S. Cl. 428—90 **4 Claims**



1. A heat-transferrable applique comprising a base sheet; a sublimable dye layer on the surface of the base, which layer is formed by printing sublimable dyes of relatively low sublimation fastness on the base sheet; a short fiber layer temporarily bonded to the sublimable dye layer by means of a porous temporary adhesive layer, said adhesive layer having such porosity as to enable the sublimable dye to pass therethrough upon sublimation, said short fiber layer being dyable by sublimation of the sublimable dyes by application of heat; an adhesive layer located on the short fiber layer with its position substantially conforming to that of the sublimable dye layer, said adhesive layer having on its surface a granulated or pulverized heat-sensitive layer, wherein said short layer being dyed by the sublimation of the sublimable dye layer upon the application of heat.

4,273,818

FORCE INFEED ELEMENT FOR LAMINAR PANEL ASSEMBLY

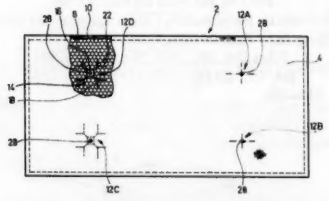
Wolfgang Buchs, Valley, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Sep. 17, 1979, Ser. No. 75,993

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1978, 2840807

Int. Cl.³ B32B *3/12*

U.S. Cl. 428—116 **15 Claims**



1. A laminar panel assembly particularly useful in space vehicles for contact with solar cells including a first and a second cover layer, a support core structure interposed between said first and second layers and at least one force infeed element disposed within said core structure between said first and second layer for punctiform load infeed to said panel assembly, said force infeed element comprising at least one solid central piece extending between said cover layers for punctiform load infeed, and shear resistant webs extending between said cover layers from said central piece disposed substantially perpendicularly to said cover layers, said shear resistant webs being arranged to connect said cover layers and to extend into partial areas of said support core structure surrounding said central piece and being surface-bonded therewith, said force infeed element being constructed with said shear resistant webs extending radially outwardly from said central piece in a branched formation such that the number of shear resistant webs increases with increasing radial distance from said central piece.

4,273,819

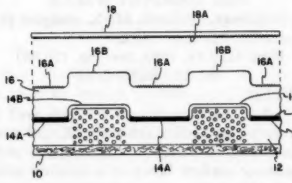
DIFFERENTIAL GLOSS PRODUCTS AND METHODS OF MAKING THE SAME

Claude J. Schmidle, Trenton, N.J., and Seevaram N. Varadhachary, Newtown, Pa., assignors to Congoleum Corporation, Kearny, N.J.

Filed Jul. 10, 1980, Ser. No. 168,844

Int. Cl.³ B32B *5/20, 31/22, 31/26*

U.S. Cl. 428—159 **13 Claims**



1. A differential gloss resinous sheet material comprising:

a base resinous material, portions of which are blown or foamed and portions of which are unblown or unfoamed;

a printing ink composition on said base resinous material in the form of a predetermined pattern or design, some printed portions of which contain a blowing or foaming inhibitor and some printed portions of which contain a polymerization promoter, said blowing or foaming inhibitor and said polymerization promoter occupying the same or different portions; and

a substantially monomer-free resinous wear layer, substantially all surface portions of which contain substantially completely polymerized and/or cross-linked and thermoset polymeric materials derived from the polymerization and/or cross-linking and thermosetting of reactive polymerizable monomeric materials brought about by the activation or decomposition of free radical polymerization initiators or catalysts, some surface portions of said substantially monomer-free resinous wear layer being elevated or chemically embossed and other surface portions being of normal height or chemically unembossed and some surface portions of said substantially monomer-free resinous wear layer having a shiny or lustrous, smooth, high gloss surface and other surface portions having a dead or dull, mechanically embossed, low gloss surface,

combinations of (1) said blown or foamed and unblown or unfoamed portions, and (2) said printed portions containing said blowing or foaming inhibitors and said polymerization promoters, and (3) said high gloss and said low gloss surface portions being in substantially perfect registry.

4,273,820

EMBOSSED SHEET TYPE COVERING MATERIAL

William F. Swietzer, Danielsville, Pa., assignor to GAF Corporation, New York, N.Y.

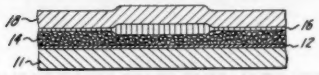
Filed Aug. 5, 1976, Ser. No. 711,813

Int. Cl.³ B32B *3/30, 31/26*

U.S. Cl. 428—159 **17 Claims**

1. A process for making decorative sheet type covering material comprising the steps of:

(a) forming an embossed foamed plastic layer adhered to a substrate;
(b) subsequently covering said embossed layer with a layer of heat curable, translucent plastic; and
(c) heating the material sufficiently to cure said layer of translucent plastic and to allow embossed portions of the embossed layer to partially expand to form raised portions in the layer of translucent plastic corresponding to embossed portions of the embossed layer.



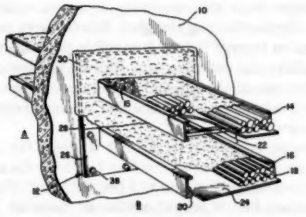
10. Decorative sheet type covering material comprising:
(a) a substrate;
(b) an embossed, foamed plastic layer adhered to said substrate; and
(c) a translucent, heat cured plastic layer adhered to said embossed layer and having raised portions corresponding to embossed portions of the embossed layer.

4,273,821

FIRE PROTECTIVE TAPE

J. Watson Pedlow, P.O. Box 33, Media, Pa. 19063

Continuation-in-part of Ser. No. 872,820, Jan. 27, 1978, Pat. No. 4,189,619. This application Nov. 6, 1979, Ser. No. 92,063
The portion of the term of this patent subsequent to Feb. 19, 1997, has been disclaimed.
Int. Cl.³ B32B *7/00, 9/04, 5/16;* **H02G** *3/04*
U.S. Cl. 428—215 **12 Claims**



1. An electrical arc and fire protective tape for disposition about electrical equipment, cables, cable splices, appurtenant equipment or the like, comprising a resinous mixture coated as a wet mastic mixture and dried upon a fabric base or plastic sheet or film substrate, said mastic comprising an essentially halogen-free mixture of solids and thermoplastic binder resins dispersed as an emulsion in water, said solids including heat intumescing and expanding substances in approximate quantity of 4 to 25% to expand the mastic to porous heat insulating foam, ceramic frits in approximate quantity of 5 to 40% to provide a ceramic glaze upon the surface of the dry expanded mastic when exposed to high temperatures developed by fire, hydrated substances in approximate quantity of 10 to 40% and having bonded water evolvable only by application of sufficient heat to decompose and evolve water vapors, and a resinous thermoplastic binder in approximate quantity of 5 to 40% to bind said solids to the form of a flexible film in coated form of the mastic, said binder being dispersed as an emulsion in water, there being sufficient water in the emulsion to convert said solids into a fluidized form for application as a coating upon said base or substrate, said percentages being by weight, the said solids quantity being based on the total solids of the composition.

4,273,822

GLAZING PASTE FOR BONDING A METAL LAYER TO A CERAMIC SUBSTRATE

Kenneth R. Bube, Skillman, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 18, 1977, Ser. No. 816,712
Int. Cl.³ B32B *5/16, 15/04, 17/06*
U.S. Cl. 428—216 **17 Claims**

1. A glazing paste comprising:
(a) about 80 to about 95 percent by weight of a glass frit;
(b) about 5 to about 20 percent by weight of a metal oxide powder selected from the group consisting of aluminum oxide, magnesium oxide, calcium oxide and zinc oxide; and
(c) an organic vehicle wherein the glass frit and the metal oxide powder is suspended in the vehicle to form a paste.

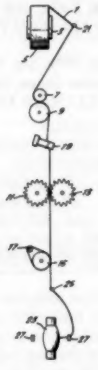
8. A hybrid microcircuit device comprising a ceramic substrate, a first glass-rich layer on the substrate and a second metal layer bonded to the substrate by the first layer wherein the first layer is prepared by sintering to the substrate a glazing paste comprising:
(a) about 80 to about 95 percent by weight of a glass frit;
(b) about 5 to about 20 percent by weight of a metal oxide powder selected from the group consisting of aluminum oxide, magnesium oxide, calcium oxide and zinc oxide; and
(c) an organic vehicle wherein the glass frit is suspended in the vehicle to form a paste.

4,273,823

GEAR CRIMPED POLYESTER YARNS

Frederick W. Shaw, and William E. Whale, both of Harrogate, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Oct. 9, 1979, Ser. No. 82,924
Claims priority, application United Kingdom, Oct. 27, 1978, 42271/78
Int. Cl.³ D03D *3/08;* **D02G** *3/00*
U.S. Cl. 428—224 **7 Claims**

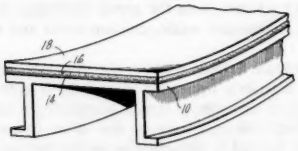


1. A drawn gear-crimped polyester yarn with latent bulk characterised by an initial crimp as defined of at least 1.5% and a mechanical crimp stability as defined of above 0%.

4,273,824
CERAMIC FACED STRUCTURES AND METHODS FOR MANUFACTURE THEREOF

Charles C. McComas, Stuart, and Larry S. Sokol, West Palm Beach, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 11, 1979, Ser. No. 38,042
Int. Cl.³ B32B *15/18*; F01D *11/08*; F04D *29/08*
U.S. Cl. 428—256 **28 Claims**



1. A method for fabricating a ceramic faced article, comprising the steps of:

forming a porous pad of metallic material to the general contour of the desired finished surface;

impregnating the porous pad with an underlayment coating of MCrAlY type material at the contoured surface of the pad to provide a roughened surface including the application of said underlayment coating at coating particle velocities on the order of four thousand feet per second (4000 fps) to attain deep impregnation of the coating into the porous pad; and

applying a ceramic material over the roughened surface of the pad to form the ceramic surfaced article.

11. A ceramic faced structure of the type suited for use in high temperature environments comprising:

a porous pad of metallic material having a low modulus of elasticity which is formed to the general contour of the desired ceramic faced structure;

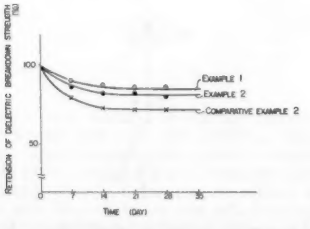
an underlayment coating of MCrAlY type material having an equivalent depth of greater than five thousandths of an inch (0.005 in.) but less than ten thousandths of an inch (0.010 in.) which has been impregnated into the porous pad to provide a roughened surface for adherence of the ceramic;

a ceramic material which has been applied over the underlayment coating to form the ceramic facing on the structure.

4,273,825
ELECTRIC INSULATING SHEET

Ryota Nishiyama; Takashi Koike, and Shunji Seino, all of Tokyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Jul. 23, 1979, Ser. No. 60,633
Claims priority, application Japan, Jul. 27, 1978, 53/91889
Int. Cl.³ B32B *5/16*
U.S. Cl. 428—223 **4 Claims**



1. An electric insulating laminated sheet comprising:

(i) a heat resistant wet-formed base web layer consisting essentially of pulp-like particles of an aromatic polyamide or an aromatic polyamide-imide and short fibers of said aromatic polyamide or aromatic polyamide-imide; and

(ii) a wet-formed web layer of a mixture consisting essentially of tiny mica flakes in an amount of at least 91 parts by weight with pulp-like particles of an aromatic polyamide or an aromatic polyamide-imide in an amount of at most 9 parts by weight,

wherein said laminated sheet is bonded together without an adhesive by hydrogen bonding within the mica layer (ii) and the heat-resistant base layer (i), as well as between the two layers.

4,273,826
PROCESS OF MAKING GLASS ARTICLES HAVING ANTIREFLECTIVE COATINGS AND PRODUCT

Howard L. McCollister, Albuquerque, N. Mex., and Norman L. Boling, Santa Rosa, Calif., assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 3, 1979, Ser. No. 99,452
Int. Cl.³ B32B *3/26, 5/18*; C03C *15/00, 17/02*
U.S. Cl. 428—304 **10 Claims**

1. A process of making a glass article containing a thin surface film antireflective coating which comprises

(1) providing a dispersion of organic derivatives of more than one inorganic cation, said dispersion containing at least one metallo-organic compound in solution in a liquid solvent, the components of said dispersion being capable of decomposition and reaction together under the influence of heat to form an inorganic oxide glass capable of phase separation into two immiscible phases on further heating,

(2) depositing a thin coating of such dispersion on the glass article, heating the coating to drive off the solvent and to decompose the organic components, thus forming a glass film layer from the remaining inorganic oxide components, further heating the glass film layer to cause phase separation thereof into to immiscible phases, and thereafter etching and leaching such film to dissolve out preferentially one of the phases of the phase separated glass, leaving a skeletonized surface film having a graded refractive index.

4. A process according to claim **1** wherein the said phase separated glass film layer is less than 1 micron thick.

7. A process of claim **4** wherein the thickness of said skeletonized surface film is less than that of the total glass film applied to the surface of said glass article according to said process.

9. A product of the process of claim **7** wherein the inorganic oxide glass of paragraph (1) has a composition different than glass article of paragraph (2).

4,273,827
ADHESIVE ASSEMBLY

Theodore J. Sweeney, Grosse Pointe City, and John G. Haviland, Orchard Lake, both of Mich., assignors to Theodore Sweeney & Company, Detroit, Mich.

Filed Jun. 9, 1978, Ser. No. 914,003
Int. Cl.³ B32B *5/16*
U.S. Cl. 428—307 **4 Claims**

1. An adhesive assembly comprising;

a. a first adhesive;

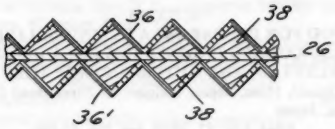
b. a second adhesive which is of a different chemical composition than the first adhesive and wherein the adhesive is encapsulated or is retained in bubbles of a plastic film; and

c. positioned between said first and second adhesives, a barrier means for preventing contamination of the respective adhesives or the substrates to which they adhere, wherein said barrier means is also a carrier means for carrying said adhesives; and components a, b and c being

an integral assembly, wherein the adhesive assembly is selected from the adhesive group consisting of:

(1) the second adhesive is comprised of an anaerobic adhesive and the first adhesive is comprised of a spongy adhesive mass;

(2) the second adhesive is comprised of an anaerobic adhesive and the first adhesive is comprised of a foam or spongy layer with an adhesive layer atop said spongy layer; and



(3) the second adhesive is comprised of a silicone or urethane adhesive and the first adhesive is comprised of a foam or spongy layer with an adhesive layer atop said spongy foam.

4,273,828

BULK GLASS HAVING IMPROVED PROPERTIES

Chester E. Tracy, South River, and Werner Kern, Hightstown, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 14, 1979, Ser. No. 66,334

Int. Cl.³ B32B *9/00*

U.S. Cl. 428—336 **7 Claims**

1. A shaped bulk glass body having a film on at least a portion of the surface thereof of a plasma deposited amorphous polymeric hydrogenated silicon-silicon nitride of the formula $-Si_xN_yH_z-_n$, where x, y, z, and n are integers, said film being at least 500 angstroms in thickness and having a compressive strength of at least about 0.7×10^9 dynes/cm^2 and said bulk glass body having a resistance to deformation sufficient to limit the deformation induced by the film on the surface to less than about 5%.

4,273,829

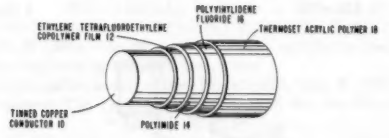
INSULATION SYSTEM FOR WIRE AND CABLE

Aimé J. Perreault, South Burlington, Vt., assignor to Champlain Cable Corporation, Wilmington, Del.

Filed Aug. 30, 1979, Ser. No. 71,205

Int. Cl.³ B32B *15/08*; H01B *7/04, 7/18*; B32B *27/30*

U.S. Cl. 428—383 **5 Claims**



1. An insulated electrical conductor comprising a metallic conductor insulated with (A) a film selected from ethylene tetrafluoroethylene copolymer and fluorinated ethylene-propylene (FEP) copolymer coated polyimide, and (B) a topcoat insulation system comprising a first layer of insulation consisting essentially of a high melting polyimide coating adhering to said film, a second layer of insulation consisting essentially of polyvinylidene fluoride coating adhering to the surface of the polyimide coating and a third layer of insulation consisting essentially of a crosslinked acrylic polymer coating adhering to the surface of the polyvinylidene fluoride.

4,273,830

FIBRILS OF CROSS LINKED POLYESTER RESIN HAVING A VESICULATED STRUCTURE

John Gillan, Langwarrin, and Colin M. Richards, Black Rock, both of Australia, assignors to Dulux Australia Limited, Melbourne, Australia

Filed Aug. 21, 1979, Ser. No. 68,391

Claims priority, application Australia, Sep. 12, 1978, PD5907

Int. Cl.³ D02G *3/00*

U.S. Cl. 428—398 **2 Claims**

1. Fibrils of vesiculated crosslinked polyester resin wherein the diameter is from 1 μm to 2 mm, the length from 50 μm–5 cm and the aspect ratio from 10 to 50.

4,273,831

POWDERED POLYMER COMPOSITIONS PRODUCED BY ELECTRON BEAM POLYMERIZATION OF POLYMERIZABLE COMPOSITIONS

James D. Singelyn, Middletown, Conn., assignor to Kemtec, Inc., Middletown, Conn.

Continuation-in-part of Ser. No. 938,891, Sep. 1, 1978, Pat. No. 4,172,776, which is a continuation-in-part of Ser. No. 699,864, Jun. 25, 1976, abandoned. This application Jul. 23, 1979, Ser. No. 58,926

Int. Cl.³ B32B *5/16*

U.S. Cl. 428—402 **3 Claims**

1. A powdered polymer product composition consisting essentially of a polymer and at least one dispersed component therein selected from the group consisting of pigments, fillers, and the combination thereof, said polymer product composition comprising substantially spherical particles of a relatively uniform particles size of up to about 10 mils, said particles being formed from a liquid polymerizable composition including

(a) a liquid polymerizable compound selected from the group consisting of monomers, reactive unsaturated polymers, and mixtures thereof, capable of free radical polymerization, and

(b) at least one component dispersed therein selected from the group consisting of pigments, fillers, and the combination thereof,

said product having been produced by polymerizing said liquid polymerizable composition by a method in which

(a) said liquid composition is formed into a finely divided atomized spray in an inert atmosphere, said composition and spray being substantially free from solvent for said polymerizable compound, and

(b) said spray is passed through a beam of high energy electrons to polymerize substantially completely the polymerizable compound of said finely divided atomized spray of said liquid polymerizable composition while said composition is in the form of said atomized spray and in less than about one second into said powdered polymer product composition.

4,273,832

GLASS ARTICLE STRENGTHENED BY ION EXCHANGE SUBSTITUTION

Patrick M. Hogan, DuBois, Pa., assignor to Brockway Glass Company, Inc., Brockway, Pa.

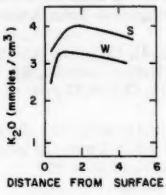
Division of Ser. No. 930,938, Aug. 4, 1978, Pat. No. 4,218,230. This application Feb. 4, 1980, Ser. No. 118,193

Int. Cl.³ B32B *7/02*; C03C *17/22, 21/00*

U.S. Cl. 428—410 **1 Claim**

1. A soda-lime-silicate glass article which has been strengthened by substituting potassium ions for sodium ions in the surface layer in the glass to produce a compressive layer, said substitution comprising spraying an aqueous exchange solution consisting essentially of at least 5% by weight potassium ions, from about 1 to about 6 weight percent of sodium ions and water to form a coating upon the glass at a temperature from about 200° C. to just below the annealing point of the glass,

maintaining said glass at a temperature below the annealing point for a time sufficient to cause ion exchange to occur, and



cooling to room temperature, whereby sodium ions are evenly and quickly replaced by potassium ions beneath the surface of the glass with reduced pitting or etching of the glass surface.

4,273,833

ANTI-FOULING OVERCOATING COMPOSITION AND USE THEREOF

Charles F. De Long, Washington, D.C., assignor to United States Trading International, Inc., Washington, D.C.

Continuation-in-part of Ser. No. 614,927, Sep. 19, 1975, Pat. No. 4,082,884. This application Mar. 30, 1978, Ser. No. 891,837

The portion of the term of this patent subsequent to Apr. 4, 1995, has been disclaimed.

Int. Cl.³ B05D *3/02*

U.S. Cl. 428—411 **20 Claims**

1. A method of reducing the fouling tendency of watercraft and stationary underwater structures consisting of applying below the water line of the watercraft or underwater structure a hard-surface leaching-type anti-fouling paint, drying the anti-fouling paint, overcoating the dried paint with an outer coating composition consisting essentially of an aqueous solution or dispersion of a carboxylated hydrophilic acrylic copolymer, a cross-linking agent for the carboxylated hydrophilic acrylic copolymer, a higher polyalkylenepolyamine or a hydrophilic higher polyalkylenepolyamine derivative and an effective amount of an ultraviolet-absorbing agent, and drying the outer coating composition over the paint.

4,273,834

MASKING OF ABRASION INJURY ON GLASS ARTICLES

Shuichi Yokokura; Yu Horie, both of Takasaki; Minoru Takamizawa, Annaka; Yoshio Inoue, Annaka, and Hiroshi Yoshioka, Annaka, all of Japan, assignors to Kirin Beer Kabushiki Kaisha and Shin-Etsu Kagako Kogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Oct. 9, 1979, Ser. No. 83,125

Claims priority, application Japan, Oct. 14, 1978, 53-126590

Int. Cl.³ B32B *17/10*

U.S. Cl. 428—429 **5 Claims**

1. A scuff-masking composition for glass articles which comprises:

a Component A which is an organopolysiloxane represented by the average compositional formula

$$(C_6H_5)_x(CH_3)_y(OR)_zSiO_{[4-(x+y+z)/2]}$$

wherein R is an alkyl group having 1 to 4 carbon atoms, and x, y and z are the numbers having the relationship

$$1 \leqq x+y < 2$$

$$1 < y/x < 10$$

$$0.4 \leqq z < 2; \text{ and}$$

a Component B which is a curing catalyst for the component A; the composition being curable at a temperature up to about 50° C. and the cured product being removable by aqueous alkali.

2. The composition as set forth in claim 1, in which the composition is in the form of an alcohol solution.

5. A glass article which has a coat film on at least a part of its surface thereby masking scuffs on the surface, the film being a cured product of the composition claimed in claim 1 or 2.

4,273,835

METHOD FOR PREPARING A CYLINDER LINER FOR LIQUID-COOLED ENGINES HAVING A BANDLIKE SEALANT ON THE OUTER-SURFACE THEREOF

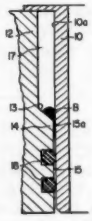
Senji Higuchi, Hino, Japan, assignor to Three Bond Co., Ltd., Tokyo, Japan

Filed Aug. 17, 1979, Ser. No. 67,586

Claims priority, application Japan, Feb. 6, 1979, 54-12465

Int. Cl.³ B32B *9/04*

U.S. Cl. 428—446 **4 Claims**



1. A method for preparing a cylinder liner for liquid-cooled engines having a bandlike sealant on the outer-surface thereof comprising the steps of

coating a putty silicone resin on the outer-surface of said cylinder line to form a belt-like layer,

curing said resin completely,

further applying said resin on said completely cured resin, and

half curing said applied resin to form a two-layer laminate of silicone resin having a completely cured inner layer and a half-cured outer layer.

4,273,836

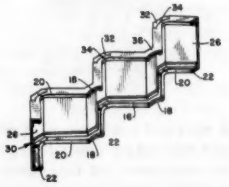
CORE STRIP BLANK, CORE STRIP AND METHOD OF MAKING SAME

James R. Campbell, South Laguna, and Roy L. Anspach, Anaheim, both of Calif., assignors to Thomas P. Mahoney, Balboa Island, Calif.

Filed Oct. 2, 1978, Ser. No. 948,011

Int. Cl.³ B32B *3/04, 3/10, 3/28*

U.S. Cl. 428—595 **8 Claims**



1. A metallic core element for use in conjunction with a plurality of identical elements in fabricating a metallic core structure of honeycomb configuration including, an elongated, corrugated strip, said strip having a web with right angularly oriented upper and lower flanges thereupon with doublers disposed, respectively, in underlying relationship with said upper flange and overlying relationship with said lower flange,

the corrugations of said strip providing alternate male and female nodes and said male nodes of one strip being fitted within the female nodes of an adjacent identical strip to provide a honeycomb core configuration.

4,273,837
PLATED METAL ARTICLE

Miguel Coll-Palagos, Rye, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 569,526, Apr. 18, 1975, abandoned. This application Nov. 22, 1976, Ser. No. 743,550
Int. Cl.[3] B32B *15/01, 15/18*
U.S. Cl. 428—647 **10 Claims**

1. A metal plated metallic article comprising:
an aluminum substrate;
an intermediate metallic coating on said aluminum substrate, said intermediate metallic coating comprising between about 0.01% and about 99.99% nickel and between about 99.99% and about 0.01% tin and having a thickness between about 0.005 mil and about 3 mils; and,
a plated metal coating on said intermediate metallic coating, said plated metal coating being selected from the group consisting of copper and nickel and chromium, wherein the interface of said aluminum substrate and said intermediate metallic coating is bonded by a region of a first intermetallic composition, said first intermetallic composition being comprised of said aluminum substrate and said intermediate metallic coating, and the interface of said plated metal coating and said intermediate metallic coating is bonded by a region of a second intermetallic composition being comprised of said plated metal coating and said intermediate metallic coating.

7. A metal plated metallic article comprising:
a zinc substrate;
an intermediate metallic coating on said zinc substrate, said intermediate metallic coating comprising between about 0.01% and about 99.99% nickel and between about 99.99% and about 0.01% tin and having a thickness between about 0.005 mil and about 3 mils; and,
a plated metal coating on said intermediate metallic coating, said plated metal coating being selected from the group consisting of copper and nickel and chromium,
wherein the interface of said zinc substrate and said intermediate metallic coating is bonded by a region of a first intermetallic composition, said first intermetallic composition being comprised of said zinc substrate and said intermediate metallic coating, and the interface of said plated metal coating is bonded by a region of a second intermetallic composition being comprised of said plated metal coating and said intermediate metallic coating.

4,273,838
WELD METAL RESISTANT TO NEUTRON-BOMBARDMENT EMBRITTLEMENT

Eric C. Biemiller, Warehouse Point, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

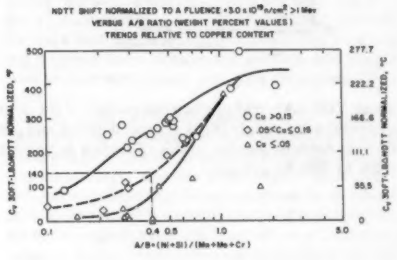
Continuation-in-part of Ser. No. 664,609, Mar. 8, 1976, abandoned. This application Jan. 28, 1977, Ser. No. 763,475
Int. Cl.[2] B23K *9/00*
U.S. Cl. 428—683 **16 Claims**

1. In the method of constructing nuclear-reactor pressure vessels wherein forging or plate-material pressure-vessel parts are joined to form the pressure vessel, the improvement wherein the joining step comprises welding the nuclear-reactor pressure-vessel parts by depositing a weldment that exhibits resistance to neutron-induced changes sufficient to prevent the weldment from being a limiting factor in reactor operations, said weldment, as deposited, consisting by weight percentages of:

Carbon	0.00 to 0.15
Manganese	1.00 to 2.20

-continued

Phosphorus	0.000 to 0.015
Sulfur	0.00 to 0.02
Silicon	0.00 to 0.40
Nickel	0.00 1.20
Chromium	0.00 to 2.50
Molybdenum	0.30 to 1.20
Copper	0.00 to 0.10
Vanadium	0.00 to 0.05



the balance being essentially iron having a ferritic structure, and wherein in said weldment the sum of the weight percentages of nickel and silicon bears a ratio of 0.4 or less to the sum of the weight percentages of manganese, chromium, and molybdenum.

9. An article comprising steel parts welded together by depositing a weldment that exhibits resistance to neutron-induced changes sufficient to prevent the weldment from being a limiting factor in operations, said weldment, as deposited, consisting by weight percentages of:

Carbon	0.00 to 0.15
Manganese	1.00 to 2.20
Phosphorus	0.000 to 0.015
Sulfur	0.00 to 0.02
Silicon	0.00 to 0.40
Nickel	0.00 1.20
Chromium	0.00 to 2.50
Molybdenum	0.30 to 1.20
Copper	0.00 to 0.10
Vanadium	0.00 to 0.05

the balance being essentially iron having a ferritic structure, and wherein in said weldment the sum of the weight percentages of nickel and silicon bears a ratio of 0.4 or less to the sum of the weight percentages of manganese, chromium, and molybdenum, the article having been exposed to neutron fluences greater than 10^{17} neutrons/cm^2.

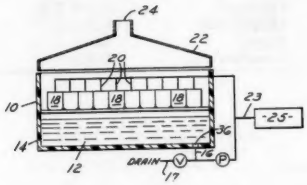
4,273,839
ACTIVATING CARBONACEOUS ELECTRODES

Peter Carr, Utica, and Alfred F. Laethem, Sterling Heights, both of Mich., assignors to Energy Development Associates, Inc., Madison Heights, Mich.

Filed Jul. 30, 1979, Ser. No. 62,108
Int. Cl.[3] H01M *2/38*
U.S. Cl. 429—51 **19 Claims**

1. A method for activating a carbonaceous electrode comprising the steps;
1. Providing a negative electrode and a carbonaceous positive electrode spaced apart from each other;
2. Providing an aqueous electrolyte with a current carrying water soluble material therein; and
3. Closing the circuit and passing a current between the positive and negative electrodes through the electrolyte

thereby generating oxygen for a period of time sufficient to activate the positive electrode, wherein the current is passed for a period of time from about 5 mAh/cm^2 to



about 1000 mAh/cm^2 of electrode surface of the positive electrode and a sample of gas generated during said period of time contains gaseous oxides of carbon in amount of 0.5% to 30% by volume.

4,273,840

BATTERY SEPARATOR AND METHOD OF PRODUCING THE SAME

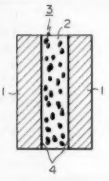
Sueo Machi, Takasaki; Isao Ishigaki, Maebushi; Takanobu Sugo, Gunma; Kazuo Murata; Shiro Tanso, both of Takatsuki, and Keizi Senoo, Takasaki, all of Japan, assignors to Japan Atomic Energy Research Institute, Tokyo and Yuasa Battery Co. Ltd., Osaka, both of, Japan

Filed Feb. 4, 1980, Ser. No. 118,100

Claims priority, application Japan, Feb. 5, 1979, 54/11990

Int. Cl.^{3} H01M *2/16*

U.S. Cl. 429—144 **18 Claims**



1. A battery separator comprising: a first layer of polymer having two major sides and containing a substance capable of catching a positive or negative active material in a metal ionic form, at least one second layer integrally bonded to at least one of said sides of the first layer of polymer forming a composite sheet of film and which contains no more such substance than that contained in said first layer of polymer, and a monomer having hydrophilic or electrolytic group grafted to said sheet of film.

4,273,841

TERNARY ELECTROLYTE FOR SECONDARY ELECTROCHEMICAL CELLS

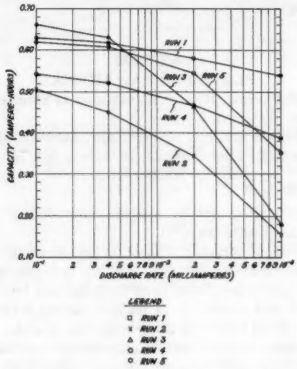
Eric J. Carlson, Reminderville, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 14, 1980, Ser. No. 178,373

Int. Cl.^{3} H01M *10/26*

U.S. Cl. 429—199 **5 Claims**

1. In a secondary electrochemical cell wherein the active material of one of the electrodes is a zinc-active material, an electrolyte comprised of an aqueous solution of 5 weight % to 10 weight % potassium hydroxide, 5 weight % to 15 weight %



potassium fluoride and 10 weight % to 20 weight % potassium phosphate.

4,273,842

PROCESS FOR FORMING PATTERNWISE COATED POWDER LAYER

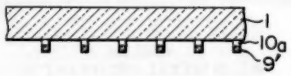
Saburo Nonogaki; Hajime Morishita, both of Tokyo; Michiaki Hashimoto, Kokubunji; Toshikatsu Manabe, Ome; Yoshifumi Tomita, and Masahiro Nishizawa, both of Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 11, 1978, Ser. No. 895,372

Claims priority, application Japan, Apr. 13, 1977, 52-41465; Oct. 14, 1977, 52-122390

Int. Cl.^{3} G03C *5/00*

U.S. Cl. 430—25 **42 Claims**



1. A process for forming a patternwise coated layer on a phosphor screen of a color picture tube, which comprises:

(1) a first step of applying a photosensitive composition containing an aromatic diazonium salt decomposable through exposure to ultraviolet light, whose photolytic product is hygroscopic, to an inside surface of a face plate of the color picture tube as a thin layer,

(2) a second step of exposing the thin layer to ultraviolet light patternwise through a shadow mask, thereby making the exposed parts sticky due to the hygroscopicity of said photolytic product and absorption of moisture by said photolytic product, and then contacting powder particles with the thin layer, whereby the powder particles adhere to said exposed parts, which are sticky, and then removing residual powder particles from the thin layer, and

(3) a third step of fixing the photolytic product resulting from the exposure to the ultraviolet light, thereby firmly binding the powder particles to said exposed parts.

4,273,843

METHOD OF DETECTING TONER CONCENTRATION IN ELECTROPHOTOGRAPHIC COPYING MACHINE

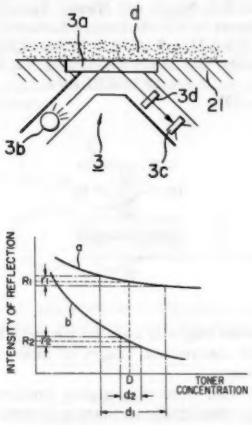
Hisao Fujita, and Kiyoshi Kimura, both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jun. 5, 1979, Ser. No. 45,759

Claims priority, application Japan, Jun. 12, 1978, 53-69929; Jun. 12, 1978, 53-69930

Int. Cl.³ G03G *15/08*

U.S. Cl. 430—30 7 Claims



1. In a method for maintaining substantially constant the concentration of toner in a two-component developer of the type containing toner and carrier particles, the steps of:

projecting light onto the developer, and

varying the amount of toner in the developer in accordance with the intensity of light of a preselected wavelength reflected from the developer, said preselected wavelength being of a value selected to maximize the intensity of reflected light in response to variations in toner concentration substantially independently of the reflection characteristics of the developer.

4. In a method according to claims 1 or 2, the preselected wavelength of the light reflected from the developer corresponding to the substantial intersection of a spectral curve of light reflected from the carrier of the developer prior to use thereof and a spectral curve of light reflected from the carrier of the developer after use.

4,273,844

HEAT-DEVELOPABLE PHOTOSENSITIVE MEMBER FOR FORMING ELECTROSTATIC PRINTING MASTERS

Hajime Kobayashi, Mitaka; Yasuhiro Yano, Tokyo, and Ichiro Endo, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 761,069, Jan. 21, 1977, abandoned. This application Aug. 9, 1978, Ser. No. 932,282

Claims priority, application Japan, Jan. 26, 1976, 51-7733; Jan. 26, 1976, 51-7742

Int. Cl.³ G03G *13/14*

U.S. Cl. 430—48 10 Claims

1. A process for electrostatic printing comprising the steps of:

(a) imagewise exposing a heat-developable photosensitive member which comprises:

a support having a resistance of not higher than 10^9 Ω-cm.;

an organic silver salt layer (B) comprising an organic silver salt (a), a halide (b), a toning agent (c) dispersed in an electrically insulating resinous binder (d), said organic silver salt layer, when treated by a process including exposure to image light, provides a silver image portion corresponding to said image light, said silver image portion having a specific resistance $\rho 1$ less than 10^{13} Ω-cm., the remaining portion of said layer having a specific resistance $\rho 2$ more than 10^{11} Ω-cm., and $\rho 1$ is less than $\rho 2$ by a factor of two powers of ten or more, said organic silver salt layer having a thickness of from 1–50 microns sufficient to form an exposed silver portion adapted to give sufficient contrast and image for use as a master in electrophotography; and

a surface protecting layer (C) having a thickness of from 0.5–15 microns having substantially no charge retentivity, having a high property of development and a high cleaning property upon electrostatic printing, and directly or with an intervening layer, overlying the organic silver salt layer (B);

a reducing agent (E) being contained in the organic silver salt layer (B), or at least one layer adjacent to the organic silver salt layer (B), or the organic silver salt layer (B) and at least one layer adjacent to the organic silver salt layer (B) and a stabilizer (g) being contained in an amount of from $2\text{–}10^{-7}$ mole per one mole of said organic silver salt (a) in the organic silver salt layer (B), or at least one layer adjacent to the organic silver salt layer (B), or the organic silver salt layer (B) and at least one layer adjacent to the organic silver salt layer (B) to form a latent silver image thereon,

(b) heat developing said latent silver image to form a silver image,

(c) employing said developed member as an electrostatic printing master by forming on electrostatic latent image thereon,

(d) developing said electrostatic latent image and

(e) transferring said developed image to an image receiving sheet.

4,273,845

HEAT-DEVELOPABLE PHOTOSENSITIVE MATERIAL

Hajime Kobayashi, Mitaka; Yasuhiro Yano, Tokyo, and Ichiro Endo, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 761,368, Jan. 21, 1977, abandoned. This application Feb. 28, 1980, Ser. No. 125,672

Claims priority, application Japan, Jan. 23, 1976, 51/6497; Jan. 26, 1976, 51/7731; Jan. 26, 1976, 51/7732; Jan. 26, 1976, 51/7734

Int. Cl.³ G03G *13/14*

U.S. Cl. 430—48 2 Claims

1. In a process for electrostatic printing comprising the steps of:

(i) imagewise exposing a supported heat developable photosensitive member having a layer formed by dispersing uniformly an organic silver salt compound in an insulating medium, to form a latent silver image;

(ii) heating with or after said imagewise exposure to develop said latent image and form a conductive metallic silver grain image;

(iii) employing said supported developed member as a master by forming an electrostatic latent image thereon;

(iv) developing said latent image and,

(v) transferring the developed image to a transfer material, the improvement comprising; employing a heat-developable photosensitive member for producing an electrostatic printing master having improved electrostatic characteristics comprises a support,

(a) an organic silver salt,

(b) an organic acid,

(c) a halide,

(d) a reducing agent, and

(e) a binder, having an equilibrium moisture content of not more than 3% at a relative humidity ranging from 20 to

100% at least the organic silver salt (a) and the organic acid (b) being dispersed in the binder (e), the amount of the organic silver salt (a) being at least 10 molar percent based on the sum of the organic silver salt (a) and the organic acid (b), and the amount of the binder (e) being 0.02–20 parts by weight based on one part of the organic silver salt (a).

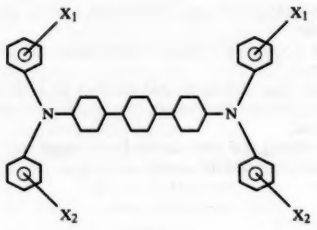
4,273,846

IMAGING MEMBER HAVING A CHARGE TRANSPORT LAYER OF A TERPHENYL DIAMINE AND A POLYCARBONATE RESIN

Damodar M. Pai, Fairport; S. Richard Turner; John F. Yanus, both of Webster; Dale S. Renfer, Rochester, and Milan Stolka, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 23, 1979, Ser. No. 97,024
Int. Cl.³ G03G 5/10, 5/14
U.S. Cl. 430—59 **9 Claims**

1. An imaging member comprising a charge generation layer comprising a layer of photoconductive material and a contiguous charge transport layer of an electrically inactive polycarbonate resin material having dispersed therein from about 25 to about 75 percent by weight of one or more diamine compound having the general formula:



wherein X_1 and X_2 are independently selected from the group consisting of a lower alkyl group having from 1 to about 4 carbon atoms, chlorine in the ortho, meta or para position, a para phenyl group and combinations thereof, said photoconductive layer exhibiting the capability of photogeneration of holes and injection of said holes and said charge transport layer being substantially nonabsorbing in the spectral region at which the photoconductive layer generates and injects photogenerated holes but being capable of supporting the injection of photogenerated holes from said photoconductive layer and transporting said holes through said charge transport layer.

4,273,847

INKS FOR PULSED ELECTRICAL PRINTING AND METHODS OF PRODUCING SAME

Donald J. J. Lennon; John R. Hagerstrom, both of Acton, and C. Frederick W. Ekman, Bedford, all of Mass., assignors to EPP Corp., Boston, Mass.

Continuation of Ser. No. 710,282, Jul. 30, 1976, abandoned. This application Dec. 12, 1979, Ser. No. 102,876
Int. Cl.³ G03G 9/08
U.S. Cl. 430—106 **7 Claims**

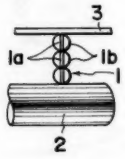
1. A printing ink comprising particles each having
a body of fusible resin with a colorant dispersed therein, said body being about two to ten microns in size, and
an electrically conductive coating overlying the surface of said body and consisting of electrically conductive carbon particles adhering thereto substantially by van der Waals forces, said particles being in sufficiently close mutual proximity for continuous electrical conduction therebetween within said coating and forming a layer of average thickness substantially exceeding the diameters of the particles, said printing ink having a volume resistivity of from 10 to 10^3 ohm cm. measured at between one and two volts per cm., said coating comprising between 5 and 10 percent by weight of said printing ink.

4,273,848

ORIENTED MAGNETIC TONER

Sanji Inagaki; Koji Nagai, and Hiromi Kameda, all of Itami, Japan, assignors to Minolta Camera Kabushiki Kaisha, Japan

Filed Mar. 5, 1979, Ser. No. 17,535
Claims priority, application Japan, Mar. 14, 1978, 53-28893
Int. Cl.³ G03G 9/14
U.S. Cl. 430—107 **3 Claims**



1. A particulate magnetic toner for magnetic brush development of latent electrostatic images to toner images, which toner comprises:
a first and third portion consisting predominantly of an insulating, substantially non-magnetic resin and a
second portion comprising a magnetic material sandwiched between said first and third portions, said second portion portion being exposed at least at opposed surfaces of the toner particles and
said toner exhibiting a relatively low resistivity during development of said latent electrostatic images to toner images while exhibiting a relatively high resistivity during transfer of said toner images to a sheet for receiving said images.

4,273,849

METHOD OF USING LIQUID ELECTROGRAPHIC DEVELOPERS CONTAINING POLYMERIC QUATERNARY SALTS

Stewart H. Merrill; Alec N. Mutz, and Frederick A. Stahly, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 43,860, May 29, 1979, Pat. No. 4,229,513, which is a continuation-in-part of Ser. No. 824,132, Aug. 12, 1977, abandoned. This application Mar. 31, 1980, Ser. No. 135,757
Claims priority, application United Kingdom, Aug. 11, 1978, 33132/78
Int. Cl.³ G03G 13/10
U.S. Cl. 430—119 **11 Claims**

1. A process for developing a latent electrostatic charge image comprising forming said electrostatic charge image on an insulating electrographic element and by contacting it with a liquid developer comprising an electrically insulating carrier liquid having dispersed therein a soluble quaternary ammonium salt copolymer that is free of cations of alkali metals and alkaline earth metals, a soluble acrylic polar copolymer, and a halogenated polymer.

4,273,850

TWO-COMPONENT DIAZOTYPE MATERIAL

Hans-Dieter Frommeld, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 25, 1980, Ser. No. 124,575

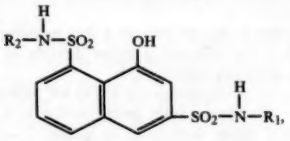
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1979, 2907446

Int. Cl.[3] G03C *1/58, 1/54*

U.S. Cl. 430—173 8 Claims

1. In a two-component diazotype material, composed of a support and of an acid-stabilized light-sensitive layer applied to the support, said layer containing at least one benzene diazonium salt as the light-sensitive component and at least one coupler,

the improvement being that said diazonium salt includes at least one 2,5-dialkoxy-4-mercaptobenzene diazonium salt and said coupler includes at least one compound of the general formula



in which R_1 and R_2 are identical or different and denote hydrogen or alkyl, alkenyl, aralky, aryl or cycloalkyl groups, which can be further substituted.

4,273,851

METHOD OF COATING USING PHOTOPOLYMERIZABLE LATEX SYSTEMS

Thaddeus M. Muzyczko, and Daniel C. Thomas, both of Melrose Park, Ill., assignors to Richardson Graphics Company, Des Plaines, Ill.

Division of Ser. No. 43,478, May 29, 1979, Pat. No. 4,224,398, which is a division of Ser. No. 873,383, Jan. 30, 1978, Pat. No. 4,186,069. This application Mar. 26, 1980, Ser. No. 134,275

Int. Cl.[3] B05D *3/06;* G03F *7/08*

U.S. Cl. 430—175 18 Claims

1. A method of coating a substrate with an oleophilic matrix, comprising: forming a light-sensitive latex coating composition that is a three-phase precursor polymer emulsion of an emulsified water-insoluble polymer particulate component in an aqueous medium containing a water-soluble or water-dispersible light-sensitive polymer component having multiple light-sensitive moieties; applying said three-phase precursor polymer emulsion to a substrate; drying said precursor emulsion by removing most of the water phase therefrom; and exposing said dried emulsion to actinic radiation for curing and water-insolubilizing said light-sensitive polymer and simultaneously forming a matrix of cross-linked light-sensitive polymer with said polymer particulates dispersed therethrough.

4,273,852

INSTANT FILM UNIT

Gerald A. Lange, and Charles J. Simpson, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 26, 1979, Ser. No. 106,643

Int. Cl.[3] G03C *5/54;* G03D *9/00*

U.S. Cl. 430—209 9 Claims

1. In a film unit including first and second superposed sheets, said first sheet carrying photosensitive material for recording a processable latent image and said second sheet serving to aid in the distribution of a processing fluid over the photosensitive material, said film unit further including a mask between said sheets having an aperture defining an imaging area, side rails between said sheets spaced laterally on opposite sides of the aperture, and a pouch at one end of the imaging area for supplying the processing fluid; such film unit being adapted for use with processing apparatus which includes a pressure nip of predetermined length sufficient to span the aperture for rupturing the pouch and distributing the fluid between the sheets across the imaging area; the film unit improvement comprising:

said mask having a predetermined thickness for controlling the nominal depth of the distributed processing fluid;

said side rails having a predetermined thickness spacing the lateral edges of the sheets apart by an amount significantly greater than the nominal depth of the distributed fluid; and

said lateral spacing between said side rails being slightly greater than the length of the pressure nip, whereby said rails are disposed outside of the nip during the distribution of the processing fluid where they accommodate fluid of greater depth than said nominal depth ahead of the nip and enhance the uniformity of the distribution controlled by the mask.

4,273,853

METAL COMPLEXES OF COPOLYMERS COMPRISING VINYLIMIDAZOLE AND THEIR USE IN PHOTOGRAPHIC ELEMENTS

Ignazio S. Ponticello; Henry J. Sniadoch, and George Villard, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 30, 1979, Ser. No. 25,686

Int. Cl.[3] G03C *7/00, 1/40, 5/54*

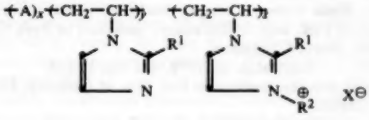
U.S. Cl. 430—213 15 Claims

1. In an image transfer film unit to be processed by an alkaline processing composition, said film unit comprising:

(1) a support having thereon at least one layer containing a photosensitive silver halide emulsion having associated therewith a dye-forming material; and

(2) a dye image-receiving layer located between said support and said layers containing the silver halide emulsion;

the improvement wherein the dye image-receiving layer contains a copolymer having the recurring units



wherein:

A is a unit derived from an ethylenically unsaturated monomer;

R^1 is H, alkyl or alkyl substituted with a metal-coordinating group or salts thereof;

R^2 is alkyl or aralkyl;

$X^{\ominus}$ is an acid anion;

x is 10 to 80 mole percent;

y is 10 to 80 mole percent; and

z is 5 to 20 mole percent;

said polymer having associated therewith metal ions, said metal ions being either in the same layer as the polymer or in a layer between the support and the layer containing said polymer.

4,273,854

METHOD FOR IMPROVING THE LIGHT FASTNESS OF ORGANIC SUBSTRATE MATERIALS INCLUDING PHOTOGRAPHIC DYE IMAGES

Hiroshi Hara, Asaka; Kotara Nakamura, and Yoshiaki Suzuki, both of Minami-ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Division of Ser. No. 969,520, Dec. 14, 1978. This application May 15, 1980, Ser. No. 150,114

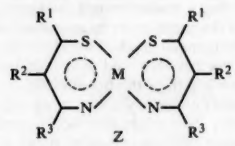
Claims priority, application Japan, Dec. 14, 1977, 52-150345

Int. Cl.[3] G03C *1/10, 1/40, 1/84*

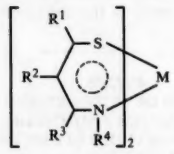
U.S. Cl. 430—216 2 Claims

1. A diffusion transfer color photographic material compris-

ing a photosensitive element and an image-receiving element, said image-receiving element comprising a support having thereon a mordanting layer containing a complex of the formula (I) or (II)



(I)



(II)

wherein M represents a Cu, Co, Ni, Pd or Pt atom; R^1 and R^4, which may be the same or different, each represents an alkyl group or an aryl group; R^2 and R^3, which may be the same or different, each represents a hydrogen atom, an alkyl group or an aryl group; or R^1 and R^2, and R^3 and R^4 combine with each other to represent a non-metallic atomic group necessary for forming a 6-membered ring; and Z represents the non-metallic atomic group necessary to complete a 5-membered ring, a 6-membered ring, an 8-membered ring or a 10-membered ring.

4,273,855

PHOTOGRAPHIC DIFFUSION TRANSFER PROCESS AND MATERIAL FOR THE PRODUCTION OF COLOR IMAGES AND SUITABLE COMPOUNDS THEREFOR

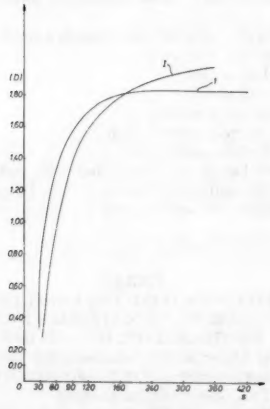
Jan Jaeken, Hove; André Verhecken, Mortsel, both of Belgium; Hans Vetter, Cologne, and Paul Marx Leverkusen, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

Filed Mar. 12, 1979, Ser. No. 19,582

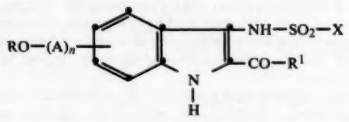
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1978, 2811720

Int. Cl.³ G03C *1/40, 1/10, 7/00, 5/54*

U.S. Cl. 430—242 **3 Claims**



1. Photographic diffusion transfer process for making colour images according to which a photographic material with at least one light-sensitive silver halide emulsion layer and associated with this layer a non-migratory colour-providing compound, which in its oxidized form and in alkaline medium is capable of releasing a diffusing dye, is image-wise exposed and developed with a silver halide developing agent, which in its oxidized form oxidizes the non-migratory colour-providing compound as a result of which oxidation the latter is split by a developer alkali under formation of an image-wise distribution of the released diffusing dye, characterized in that the non-migratory colour-providing compound corresponds to the following general formula:



wherein:

R represents an alkyl group of 1 to 4 C atoms;

A represents an oxyalkylene group;

n is 1 or 2;

X represents a dye residue or a dye precursor, which is bound to the SO_2-group either directly or through Z acting as an intermediate link;

Z represents an alkylene group of 1 to 6 C atoms, an arylene group or a heterocyclic group, which is linked to the residue X either directly or by means of —O—, —S—, —SO_2—, —NR— (R being hydrogen or an alkyl group), —CO—, —CONH— or —SO_2NH—;

R^1 represents —OR^2, —SR^2 or

R^2 being hydrogen, an alkyl group with 1 to 22 C atoms, a cycloalkyl group or an aryl group, R^3 being one of the residues defined under R^2 or being an acyl residue which is derived from an aliphatic or aromatic carboxylic or sulphonic acid, and R^4 being hydrogen or an alkyl group with 1 to 22 C atoms.

4,273,856

POSITIVE RESIST TERPOLYMER COMPOSITION AND METHOD OF FORMING RESIST PATTERN

Yasuhiro Yoneda; Toshisuke Kitakohji, both of Yokohama, and Kenro Kitamura, Fujisawa, all of Japan, assignors to Fujitsu Limited, Japan

PCT No. PCT/JP78/00021, § 371 Date Jul. 2, 1979, § 102(e) Date Jul. 7, 1979, PCT Pub. No. WO79/00283, PCT Pub. Date May 31, 1981

This PCT application filed Jul. 2, 1979, Ser. No. 112,309

Claims priority, application Japan, Nov. 7, 1977, 52-133336

Int. Cl.³ G23C *1/68*

U.S. Cl. 430—270 **7 Claims**

1. A cross-linkable positive working resist polymer composition comprising, a terpolymer comprised of

(a) from about 70 to about 99% by mole of units derived from a methacrylic acid ester of the formula:

$$CH_2{=}C(CH_3).COOR$$

where R is selected from the group consisting of alkyls having from 1 to 6 carbon atoms, haloalkyls having from 1 to 6 carbon atoms, benzyl and cyclohexyl,

(b) from about 1 to about 20% by mole of units derived from methacrylamide, and

(c) from about 0.05 to about 20% by mole of units derived from methacrylic acid chloride;

each amount of the units (a), (b) and (c) being based on the total moles of the units (a), (b) and (c).

4,273,857

POLYMERIC BINDERS FOR AQUEOUS PROCESSABLE PHOTOPOLYMER COMPOSITIONS

Ernst Leberzammer, New Brunswick, and Leo Roos, New Shrewsbury, both of N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 654,171, Jan. 30, 1976, abandoned, which is a continuation-in-part of Ser. No. 463,310, Apr. 23, 1974, abandoned. This application Aug. 14, 1979, Ser. No. 66,374
Int. Cl.³ G03C *1/68*
U.S. Cl. 430—281 10 Claims

1. In a photpolymerizable composition containing 0.1 to 10% by weight of an organic radiation-sensitive free radical-generating photoinitiator system, 7.5 to 35% by weight of a nongaseous ethylenically unsaturated compound capable of forming a high polymer by free radical-initiated chain addition polymerization, and 30 to 92.4% by weight of polymeric binder the improvement wherein the binder, is comprised of a mixture of from 15 to 60% by weight each of two free acid containing polymers which are insoluble in water at 85° F., the first polymer (A)

(1) being film forming when cast from solution in volatile solvent onto copper after evaporation of the solvent, the film having (a) a thickness of 0.0003 to 0.0023 inch; (b) good adhesion to copper as measured by zero delamination in the scribe cross hatch test; and (c) complete solubility within five minutes to a spray of dilute aqueous alkali at 0.04 normal NaOH, 20 p.s.i., and 80°–85° F.;

(2) having a molecular weight of at least 30,000; and

(3) having an acid number of at least 20, and the second polymer (B)

(1) having an acid number of at least 5; and

(2) when in film form of 0.0003 to 0.00023 inch thickness, being insoluble for at least 5 minutes to a spray of dilute aqueous alkali at 0.04 normal NaOH, 20 p.s.i., and 80°–85° F.

4,273,858

RESIST MATERIAL FOR MICRO-FABRICATION WITH UNSATURATED DICARBOXYLIC MOIETY

Kohtaro Nagasawa, Tokyo; Hideo Ochi, Kawasaki; Fujio Tanaka, Koshigaya, and Yumi Shibata, Tokyo, all of Japan, assignors to Somar Manufacturing Co., Ltd., Tokyo, Japan

Filed Jul. 19, 1978, Ser. No. 926,067
Int. Cl.³ G03C *5/00*
U.S. Cl. 430—296 5 Claims

1. A method of producing a resist pattern which comprises, irradiating with electrons, X-rays, or deep UV radiation having a wavelength of 3,000 Angstroms or less a substrate having thereon a thin film of a resist material consisting essentially of a polymer having a backbone formed of monomer units wherein about 1 to 100% of said monomer units contain functional group(s) bonded to an α,β-unsaturated dicarboxylic moiety of the formula (I):

$$\text{ROOCCH=CHCO}- \quad \text{(I)}$$
$$\qquad\qquad\quad \| \quad\quad\quad\

said precursor composition, a photoinhibitor composition capable of inhibiting said ligand release upon exposure to activating radiation of a wavelength longer than about 300 nm, said photoinhibitor composition containing a photolytic acid-generating compound.

43. A process for forming a negative or positive image in an imaging element comprising, in one or more operatively associated layers,

an energy-activatible image precursor composition including at least a cobalt(III) complex containing releasable ligands selected from amines, dimethylglyoxime, ethyl, aquo, chloro, bromo, acetylacetonato, nitro, and superoxo, and an image-forming material capable of generating an image in response to the release of said ligands, and in reactable association with said precursor composition, a photoinhibitor composition capable of inhibiting said ligand release upon exposure to activating radiation of a wavelength longer than about 300 nm, said photoinhibitor composition containing a photolytic acid-generating compound; the process comprising the steps of:

(a) imagewise activating by selective exposure, one of said image precursor composition and said photoinhibitor composition, whereby either ligands are released or are inhibited from release; and

(b) overall activating by exposure the other of said compositions, whereby a negative image or a positive image is produced, respectively.

4,273,861

MULTILAYER COLOR PHOTOGRAPHIC MATERIALS UTILIZING AN INTERLAYER CORRECTION COUPLER

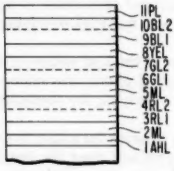
Keisuke Shiba; Takeshi Hirose; Jun Hayashi; Atsuaki Arai; Nobuo Furutachi, and Harumi Katsuyama, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 480,802, Jun. 19, 1974, Pat. No. 3,961,960. This application Feb. 23, 1976, Ser. No. 660,581

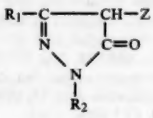
Claims priority, application Japan, Jun. 19, 1973, 48-68892

Int. Cl.[3] **G03C** *7/00, 1/76*

U.S. Cl. 430—382 **11 Claims**

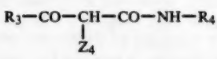


11. A process for forming color photographic images which comprises imagewise exposing a multilayer color photographic material comprising a support having coated thereon at least two photosensitive silver halide emulsion layer units which provide dye images having substantially different colors from each other by color development, at least one of said photosensitive emulsion layer units containing a coupler (A) capable of undergoing a coupling reaction with the oxidation product of a primary aromatic amine color developing agent and an interlayer color correction coupler (B) capable of providing an interlayer interimage effect, which provides a dye having a different color than that of the dye formed by the coupling reaction of said coupler (A) and the oxidation product of the primary aromatic amine color developing agent, wherein in said photosensitive emulsion layer units the dye images provided by said coupler (A) and said coupler (B) are of the same type and developing the image exposed multilayer color photographic material with a color developer solution at a temperature of 30° to 60° C., said couplers (A) and said interlayer color correction couplers (B) being couplers represented by the following general formula (I)



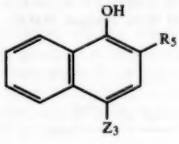
(I)

wherein R_1 represents an alkyl group, an aryl group, an alkoxy group, an aryloxy group, a heterocyclic ring, an amino group, a carbonamido group, or a ureido group; R_2 represents an alkyl group, an aryl group, or a heterocyclic group; and Z_1 represents in the case of coupler (A) a hydrogen atom or a group which is releasable on color development but which is not a development inhibitor and in the case of the interlayer color correction coupler (B), a group which is released as a or releases a development inhibitor at color development; the general formula (II)



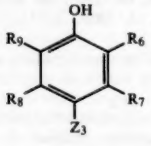
(II)

wherein R_3 represents an alkyl group or an aryl group; R_4 represents an aryl group; and Z_2 represents in the case of coupler (A) a hydrogen atom or a group which is releasable on color development but which is not a development inhibitor and in the case of the interlayer color correction coupler (B), a group which is released as a or releases a development inhibitor at color development; the general formula (III)



(III)

wherein R_5 represents a carbamyl group, a sulfamyl group, an alkoxy carbonyl group, or an aryloxycarbonyl group; and Z_3 represents in the case of coupler (A) a hydrogen atom or a group which is releasable on color development but which is not a development inhibitor and in the case of the interlayer color correction coupler (B), a group which is released as a or releases a development inhibitor at color development; or the general formula (IV)



(IV)

wherein R_6 represents an alkyl group, an aryl group, a heterocyclic group, an amino group, a carbonamido group, a sulfonamido group, a sulfamyl group, or a carbamyl group; R_7, R_8, and R_9 each represents a halogen atom, an alkoxy group, an alkyl group, an aryl group, a heterocyclic group, an amino group, a carbonamido group, a sulfonamido group, a sulfamyl group, or a carbamyl group; and Z_3 represents in the case of coupler (A) a hydrogen atom or a group which is releasable on color development but which is not a development inhibitor and in the case of the interlayer color correction coupler (B), a group which is released as a or releases a development inhibitor at color development and with the proviso that in any given photosensitive emulsion layer unit, coupler (A) and

coupler (B) are not both selected from compounds represented by the same formula above and are not both selected from compounds represented by formulas (III) or (IV) above.

4,273,862

DIRECT-POSITIVE SILVER HALIDE PHOTOGRAPHIC SENSITIVE MATERIALS

Akio Yoshida, and Seigo Ebato, both of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Continuation of Ser. No. 906,350, May 15, 1978, abandoned. This application Sep. 24, 1979, Ser. No. 78,304

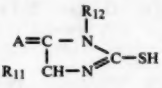
Claims priority, application Japan, Jun. 11, 1977, 52/69156; Jun. 23, 1977, 52/74844

Int. Cl.³ G03C *5/24*

U.S. Cl. 430—412 **17 Claims**

1. A process comprising developing a direct-positive silver halide photographic sensitive material containing a silver halide emulsion layer with an alkaline infections developer solution containing hydroquinone as single developing agent, characterized in that (1) the silver halide emulsion is an externally fogged direct-positive silver halide which contains not less than 70 mole % of bromide, and at least one anionic cyanine dye having a polarographic oxidation halfwave potential of not less positive than +0.3 V and (2) a development accelerator is incorporated in at least one of the layers constituting the silver halide photographic sensitive material, said development accelerator being selected from the group consisting of

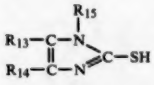
(1) 2-mercaptoimidazoline and its derivatives of the general formula



(XI)

wherein R_{11} and R_{12} each represents hydrogen atom or an alkyl group having 4 or less or carbon atoms (for example, methyl and ethyl radicals), A represents oxygen atom, two hydrogen atoms, or one hydrogen atom and an alkyl group having 4 or less carbon atoms,

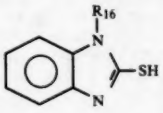
(2) 2-mercaptoimidazole and its derivatives of the general formula



(XII)

wherein R_{13}, R_{14} and R_{15} each represents hydrogen atom or an alkyl group having 4 or less carbon atoms,

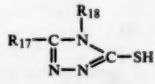
(3) 2-mercaptobenzimidazole and its derivatives of the general formula



(XIII)

wherein R_{16} represents hydrogen atom or an alkyl group having 4 or less carbon atoms,

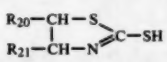
(4) 2-mercaptotriazole and its derivatives of the general formula



(XIV)

wherein R_{17} represents hydrogen atom or an alkyl group having 4 or less carbon atoms, R_{18} represents hydrogen atom, an alkyl group having 4 or less carbon atoms, allyl group or a group represented by the formula NH-R_{19}, where R_{19} represents hydrogen atom or an acyl group having 4 or less carbon atoms (for example, acetyl group or propionyl group),

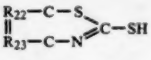
(5) 2-mercaptothiazoline and its derivatives of the general formula



(XV)

wherein R_{20} and R_{21} each represents hydrogen atom or an alkyl group having 4 or less carbon atoms,

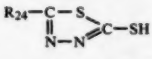
(6) 2-mercaptothiazole and its derivatives of the general formula



(XVI)

wherein R_{22} and R_{23} each represents hydrogen atom or an alkyl group having 4 or less carbon atoms, and

(7) 2-mercaptothiadiazole and its derivatives of the general formula



(XVII)

wherein R_{24} represents hydrogen atom, an alkyl group having 4 or less carbon atoms, or a group represented by the formula NH-R_{25}, where R_{25} represents hydrogen atom or an alkyl group having 4 or less carbon atoms.

2. A process comprising developing a direct-positive silver halide photographic sensitive material containing a silver halide emulsion layer with an alkaline infectious developer solution containing hydroquinone as single developing agent, characterized in that the silver halide emulsion is externally fogged direct-positive silver halide emulsion containing not less than 70 mole-% of bromide and at least one anionic cyanine dye having a polarographic oxidation halfwave potential not less positive than +0.4 V.

4,273,863

PROCESS OF FORMATION OF COLOR IMAGES, PHOTOGRAPHIC PRODUCT AND TREATING SOLUTIONS USEFUL FOR PUTTING THE PROCESS INTO PRACTICE

Jean Deabriges, Aix-En-Province; Yves Ferre, Le Perreux-Sur-Marne, and Claude Goumont, Chelles, all of France, assignors to Eastman Kodak Company, Rochester, N.J.

Division of Ser. No. 837,778, Sep. 29, 1977, Pat. No. 4,186,004. This application Jul. 27, 1979, Ser. No. 61,773

Int. Cl.³ G03C *7/00, 5/30*

U.S. Cl. 430—467 **6 Claims**

1. An alkaline processing composition comprising an amino acid selected from the group consisting of 6-aminohexanoic acid and 11-aminoundecanoic acid.

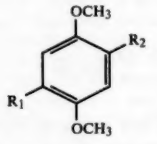
4,273,864

COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS

Tsutomu Hamaoka; Masakazu Morigaki; Satoru Sawada; Takayoshi Kamio, and Kotaro Nakamura, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Dec. 20, 1979, Ser. No. 105,485
Claims priority, application Japan, Dec. 28, 1978, 53-165359
Int. Cl.[3] G03C *1/40*
U.S. Cl. 430—551 7 Claims

1. A color photographic light-sensitive material comprising a support having thereon a silver halide emulsion layer containing a 3-anilino-5-pyrazolone type magenta coupler and at least one of the compounds represented by the formula (I)



(I)

wherein R_1 and R_2 represent each a tertiary alkyl group having 4 to 20 carbon atoms.

4,273,865

INSOLUBILIZED BIOCHEMICAL MATERIALS

Otto von Stetten, Rodgau, and Helmut Schmidt, Wuerzburg, both of Fed. Rep. of Germany, assignors to Byk-Mallinckrodt Chemische Produkte GmbH, Dietzenbach-Steinberg, Fed. Rep. of Germany

Filed Dec. 26, 1978, Ser. No. 972,846
Claims priority, application Fed. Rep. of Germany, Dec. 28, 1977, 2758507
Int. Cl.[3] G01N *33/54;* C12N *11/14*
U.S. Cl. 435—7 27 Claims

27. A stabilized biochemical composition comprising a biochemical material selected from the group consisting of antigens, antibodies, hormones, amino acids, haptens and enzymes, covalently bound to a coating of condensed heteropolysilicic acid on a mechanically strong support, the condensed heteropolysilicic acid being a copolymer of the following components:

(a) at least one substituted silane of the general formula $SiR_nR''_{(4-n)}$, —wherein R represents hydrogen, halogen, lower alkoxy or —NR'_2, wherein each R′ group may be hydrogen or lower alkyl, R″ represents lower alkyl, lower alkenyl, phenyl or phenyl lower alkyl, and n is a whole number in the range of 1-3; said substituted silane expressed as oxide being present in an amount from about 60-90% (w/w), and

(b) at least one functional silane of the general formula $SiR_n(R'''Y)_{(4-n)}$, wherein R has the meaning given above, R‴ represents lower alkylene, phenylene, lower alkenyl phenylene, or lower alkylenephenylene; Y represents halogen, an optionally substituted amino, anilino, aldehyde, keto, carboxy, hydroxy, mercapto, cyano, hydroxyphenyl, carboxylic acid lower alkyl ester, sulfonic acid, or phosphoric acid group; and n is as defined above; said functional silane expressed as oxide being present in an amount from about 1-15% (w/w).

4,273,866

LIGAND ANALOG-IRREVERSIBLE ENZYME INHIBITOR CONJUGATES AND METHODS FOR USE

Houston F. Voss; Jacob Plattner, both of Libertyville, and Thomas R. Herrin, Waukegan, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Feb. 5, 1979, Ser. No. 9,007
Int. Cl.[3] G01N *33/54;* C12N *9/99*
U.S. Cl. 435—7 3 Claims

1. A method for determining ligands in test samples comprising intermixing with the test sample a ligand analog-irreversible enzyme inhibitor conjugate and a binding protein bindable to the ligand and the ligand analog-irreversible enzyme inhibitor conjugate and wherein the amount of ligand analog-irreversible enzyme inhibitor conjugate bound by the binding protein is related to the amount of ligand in the test sample, said binding protein inactivating the irreversible enzyme inhibitor when bound to the ligand analog portion of tne conjugate; intermixing an enzyme which is irreversibly inhibited by the ligand analog-irreversible enzyme inhibitor conjugate unbound by the binding protein; and intermixing substrate to the enzyme and monitoring the enzyme substrate reaction, wherein the enzyme is acetylcholinesterase and the irreversible enzyme inhibitor is an organophosphorous enzyme inhibitor which reacts with acetylcholinesterase to form covalent bonds.

4,273,867

METHOD AND REAGENT FOR COUNTERACTING LIPEMIC INTERFERENCE

Wayne H. T. Lin, Chesterfield; James J. Grib, and Larry D. Mosier, both of St. Louis, all of Mo., assignors to Mallinckrodt, Inc., St. Louis, Mo.

Filed Apr. 5, 1979, Ser. No. 27,388
Int. Cl.[3] G01N *33/54, 31/00, 33/48*
U.S. Cl. 435—7 15 Claims

1. In a double antibody immunoassay for a substance in a lipid-containing sample, wherein the improvement comprises (a) mixing with the sample a finely-divided adsorbent selected from the group consisting of charcoal, silica gel, talc, bentonote, clay base materials, aluminia base materials, magnesia base materials, and cellulose base materials having a surface area of at least 50 square meters per gram and having an affinity for lipids in an amount sufficient to adsorb lipids present in said sample, and a nonionic, water-soluble polhydroxypolymer having a molecular weight of about 1,000 to 100,000 in an amount sufficient to accelerate precipitation of adsorbed lipids in said sample, (b) precipitating said adsorbent containing adsorbed lipids in said sample and (c) measuring said sample for said substance.

13. A reagent useful for counteracting lipemic interference in double antibody immunoassay of a lipid-containing sample, which comprises: a finely-divided adsorbent having a surface area of at least 50 square meters per gram and having a high affinity for lipids in an amount sufficient to adsorb lipids; and polyethylene glycol having a molecular weight of about 1,000 to 100,000 in an amount sufficient to accelerate precipitation of adsorbed lipids in said sample.

4,273,868

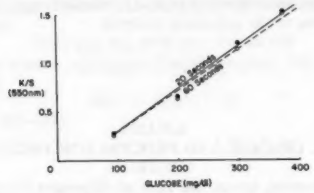
COLOR STABLE GLUCOSE TEST

Bert Walter, South Bend, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Feb. 23, 1979, Ser. No. 14,500
Int. Cl.[3] C12Q *1/54*
U.S. Cl. 435—14 1 Claim

1. A composition for the determination of glucose in a body fluid sample which comprises glucose oxidase, peroxidase, a buffer effective to maintain a pH of from about 4 to about 7.5,

a stabilizing agent and 3,3',5,5'tetramethylbenzidine, wherein the 3,3',5,5'tetramethylbenzidine is present in a concentration

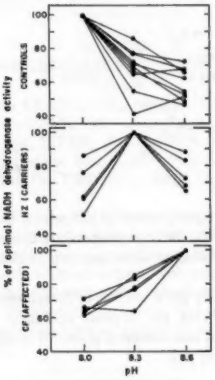


of at least about 2.6 millimoles per thousand International Units of glucose oxidase activity.

4,273,869
CYSTIC FIBROSIS DETECTION METHOD

Burton L. Shapiro, St. Paul, Minn., assignor to The Regents of the University of Minnesota, Minneapolis, Minn.

Filed Apr. 16, 1979, Ser. No. 30,179
Int. Cl.³ C12Q 1/32
U.S. Cl. 435—26 17 Claims



10. A method for the diagnosis of cystic fibrosis, the detection of non-symptomatic carriers of the disease and identification of non-affected normal individuals, which method comprises:

(A) obtaining a sample of venous blood from a human subject,

(B) isolating the lymphocytes from said blood sample,

(C) preparing a homogenate of the lymphocyte cells,

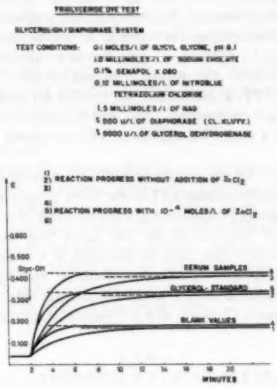
(D) performing a kinetic assay of the NADH dehydrogenase enzyme complex of the first energy conserving site of the mitochondrial electron transport system of the lymphocyte cells by determination of the pH optimum for activity of said enzyme at pH values of about 8.0, 8.3 and 8.6, and

(E) evaluating the assay by comparison with standards established as the result of similar assays of other subjects of known conditions.

4,273,870
METHOD AND COMPOSITION FOR THE DETERMINATION OF GLYCEROL

Hans Möllering, Tutzing, and Siegfried Looser, Weilheim, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Jul. 5, 1979, Ser. No. 54,728
Claims priority, application Fed. Rep. of Germany, Jul. 18, 1978, 2831580
Int. Cl.³ C12Q 1/32
U.S. Cl. 435—26 9 Claims



1. Method for the determination of glycerol, which method comprises contacting a sample with glycerol dehydrogenase, an electron transfer agent, NAD and a tetrazolium salt in amounts suitable for enzymatic activity and, in addition, at least one microgram of zinc, in the form of a water soluble zinc salt, per 50 units of glycerol dehydrogenase under conditions suitable for enzymatic activity; and determining the glycerol initially present in the sample by measuring the formation of dye.

3. Reagent for the determination of glycerol comprising glycerol dehydrogenase, an electron transfer agent, NAD, tetrazolium salt, and buffer, in amounts suitable for enzymatic acitivity; and at least one microgram of zinc, in the form of a water soluble zinc salt, for every 50 units of glycerol dehydrogenase.

4,273,871
PRODUCTION OF ANGIOGENIC FACTOR BY CELL CULTURE

William R. Tolbert, Manchester; Mary M. Hitt, St. Louis, and Joseph Feder, University City, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 3, 1980, Ser. No. 126,810
Int. Cl.³ C12P 1/00
U.S. Cl. 435—41 5 Claims

1. Process for the production of human angiogenic factor in vitro comprising growing cells of human foreskin fibroblast cell line on support surface in nutrient culture medium at about 35°–38° C. for a sufficient time to elaborate angiogenic factor and isolating the resulting angiogenic factor from the cells or cell product.

4,273,872
METHOD FOR THE MICROBIOLOGICAL CONVERSION OF STEROIDS

Pasquale Zaffaroni, Mentana; Vincenza Vitobello, and Anna M. Gamalerio, both of Rome, all of Italy, assignors to Snamprogetti S.p.A., Milan, Italy

Continuation of Ser. No. 926,232, Jul. 20, 1978, abandoned, which is a continuation of Ser. No. 797,877, May 17, 1977, abandoned. This application Nov. 13, 1979, Ser. No. 93,913

Claims priority, application Italy, May 18, 1976, 23359 A/76

Int. Cl.³ C12P *33/16*

U.S. Cl. 435—55 **8 Claims**

1. A method for the mircobiological preparation of Δ-4-cholestene-3-one from cholesterol which comprises adding cholesterol and a mixture of n-parafins to a culture of an organism selected from the group cosisting of SP2T, SP3T bis, SP5T, and SP7T/1; incubating the culture for a sufficient time to produce Δ-4-cholestene-3-one; and thereafter extracting the culture with a water immiscible solvent to obtain Δ-4-cholestern-3-one.

8. A method for the production of Δ 4-androstene-3,17-dione and Δ 1,4-androstadiene-3,17-dione from progesterone which comprises adding progesterone and a mixture of n-parafins to a culture of SP 731 RO or SP 742 XXA and incubating the culture for a sufficient time to produce Δ 4-androstene-3,17-dione and Δ 1,4-androstadiene-3,17-dione; and thereafter extracting the culture with a water immiscible solvent to obtain Δ 4-androstene-3,17-dione and Δ 1,4-androstadiene-3,17-dione.

4,273,873
PREPARATION OF ANTITHROMBOGENIC POLYMERIC MATERIALS

Akio Sugitachi, Uozaki-kitamachi; Kunihiko Takagi, Kyoto, and Yasunori Yabushita, Uji, all of Japan, assignors to Unitika Ltd., Amagasaki, Japan

Filed Oct. 25, 1977, Ser. No. 844,856

Int. Cl.³ C12N *11/08;* **A61F** *1/00*

U.S. Cl. 435—180 **11 Claims**

1. A process for preparing an antithrombogenic polymeric material, which comprises treating a polymeric material selected from the group consisting of polyacrylic acid, polymaleic acid, polyglutamic acid, alginic acid, polyethyleneimine, polymethacryloyl chloride, a polymer of bisphenol A and epichlorohydrin, polyacrolein, polymaleic anhydride, a polyamide, poly(ethylene terephthalate), a polyurethane, a silicone rubber, polyethylene, polypropylene, polyvinyl chloride, polyvinyl alcohol, polyacrylonitrile, cellulose, cellulose acetate, poly(methylmethacrylate), a polyester elastomer, poly(vinylbenzyl trialkyl ammonium ion), poly(vinylbenzyl dialkyl sulfonium ion), poly(vinylbenzyl trialkyl phosphonium ion), poly(dialkyloctamethylene ammonium ion), poly(N,N-dialkyl-3,5-methylenepiperidinium ion), and poly(dialkylaminoethyl methacrylate), with a solution of a synthetic compound which contributes to dissolution of fibrin, said synthetic compound being selected from the group consisting of a 1,2-diphenylpyrazolidine derivative, an anthranilic acid derivative, a salicylic acid derivative, a cinnamic acid derivative, a β-aryl substituted aliphatic acid, and a carboxylic acid containing a heterocyclic ring thereby to cause the synthetic compound to bond covalently or ionically to the polymeric material.

10. A process for preparing an antithrombogenic polymeric material, which comprises treating a polymeric material with a solution of a synthetic compound which contributes to dissolution of fibrin, said synthetic compound being selected from the group consisting of a 1,2-diphenylpyrazolidine derivative, an anthranilic acid derivative, a salicylic acid derivative, a cinnamic acid derivative, a β-aryl substituted aliphatic acid, and a carboxylic acid containing a heterocyclic ring, and with a solution of a fibrinolytic enzyme, thereby to cause a covalent bonding or ionic bonding of said synthetic compound and of the enzyme to the polymeric material.

4,273,874
ACIDIC URICASE AND PROCESS FOR PRODUCTION THEREOF

Toru Nakanishi, Atsugi, and Yoshimi Shigemasa, Machida, both of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Dec. 14, 1979, Ser. No. 103,579

Claims priority, application Japan, Dec. 14, 1978, 53/153648

Int. Cl.³ C12N *9/06;* **C12Q** *1/62*

U.S. Cl. 435—191 **5 Claims**

1. Acidic uricase having an optimum pH in the range of 4.7 to 5.1, and characterized by catalyzing the oxidation of uric acid to allantoin.

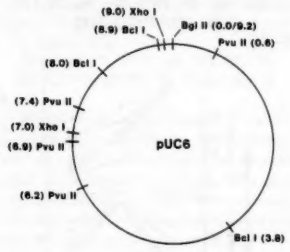
4,273,875
PLASMID AND PROCESS OF ISOLATING SAME

Jack J. Manis, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Mar. 5, 1979, Ser. No. 17,812

Int. Cl.³ C12N *1/20*

U.S. Cl. 435—253 **5 Claims**



1. Essentially pure plasmid pUC6 which is characterized by a molecular weight of approximately 6.0 megadaltons, and a restriction endonuclease cleavage map as shown in the drawing.

2. A biologically pure culture of *Streptomyces espinosus* biotype 23724a, having the deposit accession number NRRL 11439, and which also contains about 20 to about 40 copies of plasmid pUC6 per cell.

4,273,876
ENZYMATIC BATING METHOD

Rolf Monsheimer, Darmstadt-Eberstadt, and Ernst Pfleiderer, Darmstadt-Arheilgen, both of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Dec. 18, 1979, Ser. No. 104,832

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1978, 2856320

Int. Cl.³ C14C *1/00*

U.S. Cl. 435—265 **1 Claim**

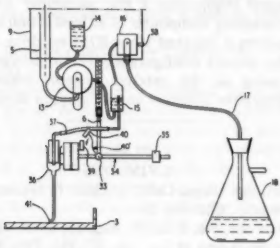
1. A method for the enzymatic bating of dehaired pelts with simultaneous removal of scud, which method comprises bating said pelts at a pH between 3 and 6 in the presence of an acid protease and of an amylase having concomitant proteolytic activity and an optimum hydrolytic activity against polysaccharides, with splitting of the α-1→4 glycosidic linkage, at a pH below 7.

4,273,877

SPIRAL PLATING APPARATUS

Gerasimos D. Anagnostopoulos, Twickenham, England, assignor to National Research Development Corporation, London, England

Filed Jun. 11, 1979, Ser. No. 47,478
Claims priority, application United Kingdom, Jun. 13, 1978, 26794/78
Int. Cl.³ C12M 1/32
U.S. Cl. 435—293 20 Claims



1. An inoculator assembly for use in a spiral plating apparatus, comprising an inoculator holder; a pivot on said inoculator holder; an arm mounted to balance on said pivot; an inoculator mounted on said arm and adapted to pass over a growth medium to be inoculated, the inoculator including a fine hollow needle through which inoculum can be dispensed, and the needle having a curved tip which can ski over the surface of the growth medium without penetrating it; and means separate from said arm for exerting a force on said inoculator such that the curved tip of the needle thereof can continuously keep contact with and follow contours on said growth medium.

4,273,878

POLYAMINE-CROSSLINKED ANION EXCHANGE RESIN

David R. Amick, Chalfont, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 927,196, Jul. 24, 1978, Pat. No. 4,191,814. This application Jun. 4, 1979, Ser. No. 45,366
Int. Cl.³ C08F 8/32; B01J 41/08
U.S. Cl. 521—32 6 Claims

1. A process for preparing anion exchange resin beads which comprises forming poly(chloromethylstyrene) beads under suspension polymerization conditions, stabilizing the beads, swelling the beads with an organic solvent, and reacting the swollen beads with a polyamine which will simultaneously crosslink and functionalize the beads, said polyamine containing at least two tertiary amine groups of which at least one is a terminal group.

4,273,879

INTUMESCENT FIRE RETARDANT COMPOSITES

Roger L. Langer, Hudson; Richard R. Licht, New Richmond, both of Wis., and Alan J. Marlor, Minneapolis, Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation of Ser. No. 891,397, Mar. 31, 1978, abandoned, which is a continuation-in-part of Ser. No. 795,936, May 11, 1977, abandoned. This application Jun. 28, 1979, Ser. No. 52,742
Int. Cl.³ C08J 9/00
U.S. Cl. 521—91 4 Claims

1. Dense, solid, flexible, heat expandable, fire retardant composite material capable of subsisting substantially indefinitely in sheet or putty form and having increased thermal insulating and sealing efficiency when exposed to temperatures above about 110° C., and capable of expanding at least up to two times its original volume consisting essentially of about 15 to 80 weight percent of sodium silicate in granular form as the intumescent component, the individual sodium silicate granules each enlarging solely upon the application of heat, about 15 to 40 weight percent of a polychloroprene binder component, up to about 40 weight percent of a phenol-formaldehyde organic char-forming resin and up to about 50 weight percent filler comprising up to about 20 weight percent active filler and up to about 40 weight percent inactive filler.

4,273,880

FOAMED POLYETHYLENE FILMS

Wichard Pump, Mulheim an der Ruhr; Wolfgang Becker, Hilden, and Edwin Woldenberg, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 19, 1979, Ser. No. 58,822
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1978, 2832287
Int. Cl.³ C08J 9/10
U.S. Cl. 521—93 4 Claims

1. A process for the continuous production of foamed films of polyethylene and/or copolymers of ethylene/vinyl acetate using azodicarbonamide as a blowing agent by the known extrusion processes of blown film, wherein from 0.1 to 1.0% by weight of a calcium salt of an aliphatic fatty acid and from 0.4 to 2.5% by weight of a zinc salt of an aliphatic fatty acid are added to the polyethylenes and/or copolymers of ethylene/vinyl acetate before or during processing.

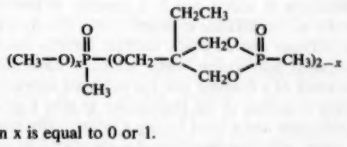
4,273,881

ORGANO-PHOSPHORUS FLAME-RETARDANT FOR POLYURETHANE FOAMS PREPARED FROM GRAFT POLYOXYALKYLENE POLYETHER POLYOLS

Jay G. Otten, Flat Rock, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 3, 1979, Ser. No. 99,817
Int. Cl.³ C08G 18/14
U.S. Cl. 521—108 4 Claims

1. A flame-retardant, flexible, high-resiliency polyurethane foam prepared by the reaction of a polyoxyalkylene polyether polyol having an average equivalent weight of from 200 to 2500, a vinylic copolymer content of at least 10 parts by weight per 100 parts of polyol, and an organic polyisocyanate in the presence of a blowing agent and an effective amount of a flame-retardant compound having the following formula



wherein x is equal to 0 or 1.

4,273,882

PREPARATION OF THERMALLY STABLE RIGID POLYURETHANE FOAM

Robert J. Raynor, North Branford, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Jun. 2, 1980, Ser. No. 155,371
Int. Cl.³ C08G 18/14
U.S. Cl. 521—110 11 Claims

1. A process for preparing a rigid polyurethane foam which comprises reacting a polyether polyol reactant with an organic polyisocyanate reactant in the presence of a foaming agent having a proportion of water ranging from about 2 to about 44 parts by weight per 100 parts of the total polyol reactant, said proportion being effective in promoting the formation of urea structures to enhance the thermal stability of said foam, said polyether polyol reactant including:

a main polyol having a hydroxyl number of about 250–650

and being the product of reacting a mixture of a carbohydrate and a member selected from the group consisting of ethylene diamine, the ethanolamines and a mixture thereof, with an oxide selected from the group consisting of ethylene oxide, propylene oxide, butylene oxide and a mixture thereof, said member being employed in a molar ratio ranging from about 1 to about 12 moles per mole of said carbohydrate;

a first supplemental polyol having a hydroxyl number of about 50–250 and being the product of reacting an aliphatic diol, triol or a mixture thereof with an alkylene oxide having 2–4 carbon atoms; and

a second supplemental polyol having a hydroxyl number of about 300–800 and being an adduct of ethylene oxide and an amine selected from the group consisting of an aliphatic amine having 1–8 carbon atoms, an aromatic primary amine having 6–8 carbon atoms, an alkanolamine in which each alkanol group contains 2–5 carbon atoms, and a mixture thereof; and wherein:

said main polyol is employed in a proportion of from about 30 to about 80 percent, said first supplemental polyol is employed in a proportion of from about 35 to about 10 percent, and said second supplemental polyol is employed in a proportion of from about 35 to about 10 percent, all percentages being based upon the total weight of said polyol reactant; and

said polyisocyanate reactant is used in an amount so as to provide about 1.0 to about 4.0 NCO groups per hydroxy group in the reaction system.

4,273,883

UREA-FORMALDEHYDE POLYMERS HAVING REDUCED FORMALDEHYDE EMISSION AND CELLULAR UREA FORMALDEHYDE FOAM WHICH IS RESISTANT TO ACID-INDUCED HYDROLYSIS

Heinz L. Korf, 4394 Beaconshillsfield Ave., Montreal NDG Quebec, Canada

Filed Apr. 8, 1980, Ser. No. 133,591
Int. Cl.³ C08J *9/30*
U.S. Cl. 521—113 **7 Claims**

1. A method of preparing a urea formaldehyde foam that is resistant to acid-induced hydrolysis, comprising:

mixing together an aqueous solution of a urea-formaldehyde resin prepolymer to which an amount of p-methoxybenzaldehyde is added which is capable of reacting with acidic but not alkaline solutions of said urea-formaldehyde prepolymer and an acidic catalyst solution containing a polyalkyl polynuclear metal sulfonate surfactant in the presence of a foaming gas, the sulfonate interacting with reactive groups of the prepolymer to give a structurally stable foam and a foam having a substantially neutral pH, thereby inhibiting the effect of acid-induced hydrolysis of the foam.

4,273,884

STABLE EMULSIONS OF POLYOLS AND CROSSLINKERS FOR POLYURETHANES

Richard J. G. Dominguez, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed May 12, 1980, Ser. No. 149,287
Int. Cl.³ C08G *18/14*
U.S. Cl. 521—114 **7 Claims**

1. An emulsion of a polyol having an hydroxy number of from about 56 to about 24 and ethylene glycol and an emulsifier comprising an ethylene oxide/propylene oxide block copolymer diol having an average molecular weight of above about 12,000 and an ethylene oxide content of from about 70% to about 90%.

4,273,885

NOVEL CATALYST SYSTEM FOR RIM ELASTOMERS

Richard J. G. Dominguez, and Doris M. Rice, both of Austin, Tex., assignors to Texaco Development Corp., White Plains, N.Y.

Filed Apr. 1, 1980, Ser. No. 136,199
Int. Cl.³ C08G *18/14*
U.S. Cl. 521—115 **4 Claims**

1. In a method for making a polyurethane elastomer of significantly improved properties wherein an aromatic polyisocyanate, a polyol of above about 500 equivalent weight, a chain extending agent comprising a low molecular weight active hydrogen containing compound of at least 2 functionality and a catalyst system is injected via a RIM machine into a mold cavity of the desired configuration the improvement which comprises using as the catalyst system dimorpholinodiethylether, dibutyltin dilaurate and an alkyltin mercaptide.

4,273,886

POLYIMIDES

John Gagliani, San Diego, Calif., assignor to International Harvester Company, Chicago, Ill.

Division of Ser. No. 935,378, Aug. 21, 1978, which is a continuation-in-part of Ser. No. 877,516, Feb. 13, 1978, abandoned. This application Feb. 15, 1980, Ser. No. 121,793
Int. Cl.³ C08J *9/02*
U.S. Cl. 521—185 **10 Claims**

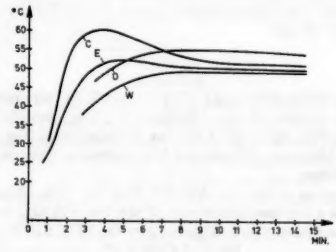
1. A copolyimide foam made by a process which includes the steps of: preparing a resinous precursor by forming a composition which is essentially a stoichiometric mixture of aromatic diamine and tetracarboxylic acid ester constituents and dispersing a filler composed of particulate or fibrous solids in said composition; heating said resinous precursor to a temperature in the range of 210–315° C. to produce a polyimide foam artifact of selected configuration; and then heating said artifact under a pressure in the range of 3–20 psig and at a temperature in the range of 230–315° C. for a time sufficient to produce a permanent set in said foam and thereby increase the rigidity and structural strength of the artifact.

4,273,887

PROCESS FOR PREPARATION OF FOAMS BY CONDENSATION REACTIONS

Per L. Wolff, Birkerod, Denmark, assignor to Koninklijke Emballage Industrie Van Leer B.V., Amstelveen, Netherlands

Filed Aug. 14, 1979, Ser. No. 66,582
Claims priority, application Netherlands, Jul. 10, 1979, 7905379
Int. Cl.³ B29D *27/04*
U.S. Cl. 521—188 **14 Claims**



1. A process for the preparation of a foam having a predetermined shape, wherein in the presence of a catalyst, a blowing agent and additives a reactive resin component is subjected to a condensation reaction, characterized in reacting the starting materials in an enclosed mould cavity under conditions wherein the water formed during the reaction is substantially free to move out into a space adjacent to and in communication

with said foam, and controlling the temperature and the cure of said foam by regulation of the wet bulb temperature of the gaseous mass inside said space.

14. Thermoset insulation foam products, manufactured in a shaped form by a process according to claim 1.

4,273,888

MACROMONOMERS

Clive W. Graetz, Glen Waverly, Australia, assignor to Imperial Chemical Industries Limited, London, England

Filed Dec. 7, 1979, Ser. No. 101,265

Claims priority, application United Kingdom, Dec. 7, 1978, 47584/78

Int. Cl.[3] C08G *63/76;* C08L *67/00*

U.S. Cl. 525—31 7 Claims

1. A macromonomer which is obtained by (i) reacting a polyethylene glycol or a monomethyl or monoethyl ether thereof with a cyclic carboxyl anhydride in an amount of at least one mole of the anhydride per hydroxyl group present in the said glycol or ether, and (ii) reacting the product so obtained with a compound containing in the molecule a single epoxide group and a single polymerisable double bond in such proportions that all carboxyl groups in the said product are thereby esterified.

6. A graft copolymer obtained by copolymerising a macromonomer as claimed in claim 1, with other monomers containing a single polymerisable double bond.

4,273,889

THERMOSETTING RESIN COMPOSITIONS AND THE CURED PRODUCTS THEREOF

Noboru Yamazaki, Nagoya, and Yoshio Morimoto, Tokai, both of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Aug. 29, 1979, Ser. No. 70,613

Claims priority, application Japan, Sep. 6, 1978, 53-108513

Int. Cl.[3] C08L *63/00*

U.S. Cl. 525—109 11 Claims

1. Thermosetting resin compositions consisting essentially of a linear homopolymer of p-isopropenyl phenol having a polymerization degree of from 2 to about 418 and an epoxy resin having at least two epoxy groups and being present in such an amount that the ratio of the number of OH groups in the phenol to the number of epoxy groups in the resin ranges from 0.5 to 2.

4,273,890

PLASTIFIERS, METHOD OF PREPARATION AND PVC COMPOSITIONS CONTAINING SAME

John W. Hirzy, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 864,553, Dec. 27, 1977, Pat. No. 4,212,957. This application Mar. 21, 1980, Ser. No. 132,484

Int. Cl.[3] C08G *63/76;* C08L *27/06, 75/06*

U.S. Cl. 525—129 9 Claims

1. An ordered, solid, block copolyesterurethane having from about 15 to about 50 percent by weight amorphous end blocks and from about 85 to about 50 percent by weight ordered copolymer center block having from 20 to about 100 percent crystallinity based on heat of fusion, said copolyesterurethane having from about 20 to about 95 percent crystallinity based on heat of fusion, said ordered copolymer consisting essentially of crystalline or semi-crystalline prepolymer blocks coupled via ester or urethane linkages said crystalline prepolymer prepared by reacting equivalent amounts of dicarboxylic acid and crystallizing dihydroxy compound, said semi-crystalline prepolymer being prepared by reacting dicarboxylic acid with a mixture of noncrystallizing dihydroxy compound and crystallizing dihydroxy compound in a ratio of non-crystallizing dihydroxy compound to crystallizing dyhydroxy compound from about 0.1 to about 0.5, and said end blocks and center block being isocyanate-coupled.

6. Composition comprising a halogen-containing polymer and a copolyesterurethane of claim 1.

4,273,891

HYDROCARBON-SUBSTITUTED METHYLOL PHENOLS

John F. Pindar, Euclid; Jerome M. Cohen, University Heights, and Charles P. Bryant, Euclid, all of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Continuation-in-part of Ser. No. 613,664, Sep. 15, 1975, Pat. No. 4,053,428, which is a continuation-in-part of Ser. No. 540,470, Jan. 13, 1975, Pat. No. 3,980,569, which is a continuation-in-part of Ser. No. 451,644, Mar. 15, 1974, abandoned. This application Sep. 6, 1977, Ser. No. 830,931

Int. Cl.[3] C08G *8/10, 8/36;* C08L *61/14;* C10M *1/28*

U.S. Cl. 525—145 15 Claims

1. A lubricant and liquid fuel additive or intermediate for such additives selected from the group consisting of (I) hydroxy aromatic compounds having:

(a) at least one hydroxyl substituent bonded directly to a carbon atom of an aromatic moiety, Ar,

(b) at least one hydrocarbon-based substituent of at least about 50 and up to about 300 aliphatic carbon atoms bonded directly to a carbon atom of the aromatic moiety, Ar, and

(c) at least one methylol or lower hydrocarbon-based substituted methylol substituent bonded directly to a carbon atom of the aromatic moiety, Ar, said compound containing no alkylene linkages between carbon atoms of two aromatic nuclei, (II) ether condensates of said hydroxy aromatic compounds and mixtures of (I) and (II).

4,273,892

PREPARATION OF HYDROPHILIC POLYOLEFIN FIBERS FOR USE IN PAPERMAKING

Terence W. Rave, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 818,364, Jul. 25, 1977, Pat. No. 4,156,628, which is a continuation-in-part of Ser. No. 721,133, Sep. 7, 1976, abandoned, which is a continuation-in-part of Ser. No. 653,188, Jan. 28, 1976, Pat. No. 4,035,229, which is a division of Ser. No. 521,002, Nov. 4, 1974, abandoned. This application Jan. 25, 1979, Ser. No. 6,969

The portion of the term of this patent subsequent to Jul. 12, 1994, has been disclaimed.

Int. Cl.[3] C08L *77/06, 61/22*

U.S. Cl. 525—180 2 Claims

1. A blend of cationic and anionic water-soluble, nitrogen-containing polymers wherein the cationic polymer is the reaction product of epichlorohydrin and the aminopolyamide derived from adipic acid and diethylenetriamine and wherein the anionic polymer is the reaction product of glyoxal and the polymer obtained by partial hydrolysis of a branched, water-soluble poly(β-alanine) and wherein the ratio of said cationic polymer to said anionic polymer in said blend is in the range of from about 1:3 to about 1:7 by weight.

4,273,893

TERNARY BLENDS OF LOW DENSITY ETHYLENE POLYMERS, ETHYLENE-ALKYL ACRYLATE COPOLYMERS AND AMORPHOUS ISOBUTYLENE POLYMERS

Khalid A. Karim, and James H. Rea, both of Houston, Tex., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Jul. 31, 1980, Ser. No. 174,300

Int. Cl.[3] C08L *23/06, 23/08, 23/20, 33/08*

U.S. Cl. 525—227 8 Claims

1. A compatible blend of polymers consisting essentially of:

(a) A low density ethylene polymer,

(b) An ethylene copolymer, and

(c) A solid amorphous isobutylene polymer;

said low density ethylene polymer having a density of less than

about 0.945 and a melt index of about 0.5–20; said ethylene copolymer having polymerized therein about 70 to 98 weight % of ethylene and the balance an alkyl ester of acrylic or methacrylic acid; said isobutylene polymer having a molecular weight of at least about 10,000; said ethylene copolymer being present in an amount constituting about 15–50 weight % of the total weight of the low density ethylene polymer and the ethylene copolymer; and said isobutylene polymer being present in the amount of said 15–75 parts by weight for each 100 parts of combined weight of the low density ethylene polymer and the ethylene copolymer.

4,273,894

THERMOPLASTIC COMPOSITION COMPRISING CHLORINATED POLYOLEFIN AND ACRYLATE POLYMER

Rainer Mücke, Burgkirchen; Johann Schiller, Neuötting, and Herbert Säckl, Unterau, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 21, 1980, Ser. No. 170,881

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1979, 2929959

Int. Cl.³ C08L *23/28, 33/08, 33/10*

U.S. Cl. 525—228 **10 Claims**

1. Thermoplastic composition essentially consisting of

(a) 60 to 95% by weight of at least one chlorinated polyolefin and

(b) 5 to 40% by weight of at least one copolymer of butadiene, styrene and an ester of acrylic acid or methacrylic acid.

4,273,895

PROCESS FOR PREPARING THERMOPLASTIC RESIN

Hiroyuki Minematsu, Niihama; Kojiro Matsumoto, Takarazuka; Tadashi Saeki, and Akira Kishi, both of Niihama, all of Japan, assignors to Sumitomo Naugatuck Co., Ltd., Japan

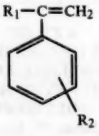
Filed Jul. 3, 1979, Ser. No. 54,507

Claims priority, application Japan, Jul. 4, 1978, 53-81753

Int. Cl.³ C08F *279/02*

U.S. Cl. 525—264 **6 Claims**

1. A process for preparing a thermoplastic resin which comprises emulsion polymerization, in the presence of a radical initiator, of a mixture comprising a monomer mixture consisting essentiall of 35 to 70% by weight of the monomer mixture of an α-alkylstyrene of the formula:



wherein R_1 is C_1–C_3 alkyl and R_2 is hydrogen, C_1–C_3 alkyl or halo C_1–C_3 alkyl, 10 to 60% by weight of the monomer mixture of methyl methacrylate, and 3 to 30% by weight of the monomer mixture of an unsaturated nitrile and a diene rubber latex containing particles at least 30% of which have a particle size of 400 to 900 Å, the weight proportion of the monomeric mixture and the diene rubber latex (solids) being from 60:40 to 95:5.

4,273,896

SILYLATED POLYMERS AND SILYLATED ORGANIC-ORGANOPOLYSILOXANE BLOCK COPOLYMERS

Eugene R. Martin, Onsted, Mich., assignor to SWS Silicones Corporation, Adrian, Mich.

Continuation-in-part of Ser. No. 924,111, Jul. 12, 1978, abandoned, which is a division of Ser. No. 813,157, Jul. 5, 1977, Pat. No. 4,148,838. This application Mar. 26, 1980, Ser. No. 134,004

Int. Cl.³ C08F *6/02, 297/02*

U.S. Cl. 525—271 **10 Claims**

1. A method for preparing a terminated silylated copolymer which comprises (1) forming a carbanion containing organic polymer by polymerizing a monomer having carbon-to-carbon double bonds in the presence of a carbanion forming catalyst, (2) reacting the carbanion containing organic polymer with a vinyl containing silane having at least one group selected from halogen, acyloxy radicals and perchlorato radicals to form a silylated copolymer and thereafter (3) reacting the silylated copolymer containing a carbanion with a compound which will react with the carbanion to form a terminated silylated copolymer, said compound is selected from the group consisting of water, carboxylic acids, carboxylic acid anhydrides, inorganic acids, alcohols and silanes which are free of aliphatic unsaturation and have at least one group selected from the class consisting of halogen, acyloxy, phosphato, sulfato, hydrocarbonoxy and perchlorato radicals.

4,273,897

VULCANIZABLE RUBBER COMPOSITIONS WITH AMINO ACIDS

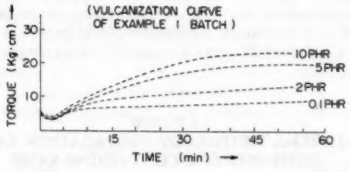
Masao Onizawa, Kunitachi, Japan, assignor to Sanyo Trading Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 625,874, Oct. 24, 1975, abandoned. This application May 23, 1979, Ser. No. 41,632

Claims priority, application Japan, Oct. 29, 1974, 49-124031; Oct. 2, 1975, 50-118242

Int. Cl.³ C08F *8/32;* **C08C** *19/22;* **C08F** *8/34*

U.S. Cl. 525—351 **5 Claims**



1. A vulcanizable composition comprising bromobutyl rubber and at least one amino acid selected from the group consisting of arginine, lysine, hydroxylysine, ornithine, cystine, asparagine, glutamine and citrulline, the amino acid component being present in an amount of 0.1 to 50 parts by weight per 100 parts by weight of the bromobutyl rubber.

4,273,898

BLOCK COPOLYMER OF POLYETHERAMIDE AND RANDOM COPOLYMER OF POLYAMIDE AND POLYETHERAMIDE

Edward M. Kohn, Philadelphia, Pa.; Stephen L. Nickol, and Robert M. Thompson, both of Wilmington, Del., assignors to Suntech, Inc., Philadelphia, Pa.

Filed Sep. 6, 1979, Ser. No. 73,331

Int. Cl.³ C08L *77/00;* **C08G** *69/40*

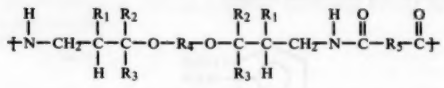
U.S. Cl. 525—432 **3 Claims**

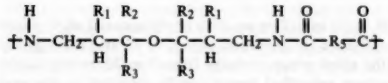
1. A block copolymer comprising blocks of polyetheramide and blocks of a random copolymer of polyetheramide precursors and precursors of ether-free polyamide and wherein the block copolymer is free from ether-free polyamide block seg-

ments and the block copolymer has the following repeating structural formula

$$-X-_w-Y-_z$$

wherein —X— is a polyetheramide selected from the group consisting of the following structural formulas:





wherein R_1, R_2 and R_3 each are selected from the group consisting of H, C_1–C_{10} alkyls and C_3–C_{10} isoalkyls and R_4 is selected from the group consisting of C_1–C_{10} alkylenes and C_3–C_{10} isoalkylenes and R_5 is selected from the group consisting of C_0–C_{10} alkylenes, C_3–C_{10} isoalkylenes and C_6–C_{20} arylenes and wherein —Y— is a bivalent radical of a random copolymer containing an etheramide distributed randomly throughout a polyamide structure and wherein the amount of the etheramide contained in the polyamide structure is sufficient to form a copolymer having a lower melting point than a corresponding homopolymer of the polyamide and wherein w and z each have a value in the range between from about 4 to about 200.

4,273,899

FIRE-RETARDANT THERMOPLASTIC POLYESTER COMPOSITION

Noritsugu Saiki, Iwakuni, and Takashi Kaneko, Matsuyama, both of Japan, assignors to Teijin Limited, Osaka and Teijin Chemicals, Ltd., Tokyo, both of, Japan

Continuation of Ser. No. 803,774, Jun. 6, 1977, abandoned. This application May 31, 1979, Ser. No. 44,242

Claims priority, application Japan, Jun. 11, 1976, 51-67589

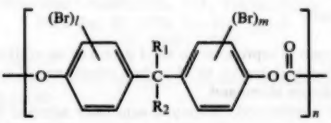
Int. Cl.³ C08G *63/62;* C08L *67/02*

U.S. Cl. 525—439 **8 Claims**

1. A fire-retardant thermoplastic polyester resin composition consisting of essentially of

(A) 100 parts by weight of an aromatic polyester resin,

(B) 1 to 100 parts by weight of a fire retardant which is a medium molecular weight polymer of a carbonate of a brominated dihydric phenol of the formula



wherein l and m each represent an integer of 1 to 4, n represents a number of about 22 to about 50, and R_1 and R_2 each represent a hydrogen atom or an alkyl group containing 1 to 5 carbon atoms, or taken together, represent a cycloalkane containing 5 to 12 carbon atoms, the carbonate polymer having a melting point of more than 300° C.,

or both said carbonate polymer and 1 to 100 parts by weight of an antimony compound, the amount of the antimony compound being calculated as metallic antimony, the composition containing no other aromatic carbonate polymer.

(C) 1 to about 120 parts by weight of glass fibers, and

(D) 0 to about 10 parts by weight of at least one additive selected from the group consisting of stabilizers, coloring agents, mold releasing agents, nucleating agents, lubricants, inorganic fillers other than the glass fibers and blowing agents.

4,273,900

DIAPHRAGM FOR ACOUSTIC EQUIPMENT

Kosaku Murata, Kobe; Satoshi Takayama, Moriguchi, and Mitsuru Ieki, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 903,798, May 8, 1978, abandoned. This application Jul. 9, 1979, Ser. No. 55,780

Claims priority, application Japan, May 7, 1977, 52/262

Int. Cl.³ C08L *67/02*

U.S. Cl. 525—444 **4 Claims**

1. A diaphragm for a sound transducing device having a lowest resonant frequency lower than or equal to 480 Hz and an inner loss between 0.04 and 0.20 which is prepared by molding a composition mainly consisting of a copolymer of poly (tetramethyleneoxide) glycol with polytetramethyleneterephthalate.

4,273,901

DISPERSIBLE VINYLIDENE CHLORIDE POLYMER MICROGEL POWDERS AS ADDITIVES FOR POLYMERS

Dale S. Gibbs; Jack H. Benson, and Reet T. Fernandez, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 942,512, Sep. 15, 1978, Pat. No. 4,232,129. This application Nov. 5, 1979, Ser. No. 91,281

Int. Cl.³ C08K *5/05, 5/13;* C08G *18/06*

U.S. Cl. 525—455 **3 Claims**

1. In a method of forming a polyurethane material by reacting a polyfunctional isocyanate with an active-hydrogen-containing material, the improvement characterized by including in the reactant mixture a crosslinked vinylidene chloride polymer microgel powder obtained by a method comprising the steps of

(I) preparing a microgel latex by emulsion polymerizing (a) about 50 to about 90 parts by weight of vinylidene chloride, (b) about 10 to about 50 parts by weight of a copolymerizable ethylenically unsaturated comonomer, and (c) a minor amount of a copolymerizable crosslinking polyfunctional comonomer, wherein the microgels in the resulting latex have a gel content of about 25 to 99 percent and a second order transition temperature of at least about 30° C., and

(II) recovering the microgel powder from the latex;

wherein the microgels prior to recovery have a diameter less than about 1 micron.

4,273,902

DENTAL SILICONE COMPOSITIONS AND THE METHOD OF USING THE SAME

Kentaro Tomioka, Chofu; Kazuhiro Watanabe, Kamifukuoka, and Eiji Iwata, Tokyo, all of Japan, assignors to G-C Dental Industrial Corp., Tokyo, Japan

Filed Jun. 15, 1979, Ser. No. 48,979

Claims priority, application Japan, Jun. 30, 1978, 53-78745

Int. Cl.³ C08L *83/06*

U.S. Cl. 525—478 **2 Claims**

1. A room temperature setting dental silicone composition comprising (a) an organopolysiloxane having in its molecule at least two vinyl groups, (b) an organohydrogen polysiloxane having in its molecule hydrogen atoms bonded to at least two silicone atoms, (c) a catalyst for accelerating the addition of the hydrogen atoms bonded to the silicone atoms with respect to the vinyl groups, and (d) hydrophobic fillers and characterized in that it further includes 0.5 ppm or more of finely divided palladium and/or a finely divided palladium alloy containing 10% by weight or more of palladium relative to the total silicone polymer components, which absorbs hydrogen gas

generated in the reaction of the polysiloxane having vinyl groups with the polysiloxane having Si-H bonds, without inhibiting the addition reaction.

4,273,903

SULPHONATED POLYARYLETHERSULPHONE COPOLYMERS

John B. Rose, Letchworth, England, assignor to Imperial Chemical Industries Limited, England

Filed Aug. 21, 1979, Ser. No. 68,466

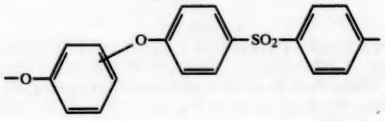
Claims priority, application United Kingdom, Sep. 5, 1978, 35589/78; Jan. 24, 1979, 02490/79

Int. Cl.³ C08G *65/40, 75/23*

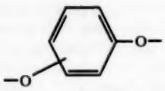
U.S. Cl. 525—534 **6 Claims**

1. A polyarylethersulphone copolymer which is a hydrophilic sulphonated copolymer having 1 to 99 mole % of repeat units based on the repeat unit which, with no sulphonation, has the formula

A

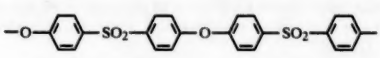


wherein substantially all of said repeat units are sulphonated, the sulphonation present being in the sub-units



with monosulphonation thereof in the case of the ether linkages being ortho or para disposed and disulphonation thereof in the case of the ether linkages being meta disposed; and 99 to 1 mole % of substantially non-sulphonated repeat units of formula

B



4,273,904

PROCESS FOR PRODUCING HOMOPOLYMERS OR COPOLYMERS OF VINYL OR VINYLIDENE MONOMERS BY EMULSION POLYMERIZATION

Charles N. Bush, Bay Village; Charles A. Daniels, and Ralph F. Koebel, both of Avon Lake, all of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

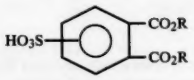
Filed Jul. 20, 1979, Ser. No. 59,341

Int. Cl.³ C08F *2/26, 14/08, 14/06*

U.S. Cl. 526—91 **14 Claims**

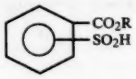
1. A process for producing polymers of vinyl and vinylidene halides and copolymers thereof with each other or either with one or more vinylidene monomers having at least one terminal $CH_2{=}C<$ grouping comprising forming in a reaction zone a polymerization mixture containing an aqueous reaction medium, the monomer or monomers to be polymerized, from about 0.01% to about 1.0% by weight of a free-radical yielding catalyst based on the weight of the monomer or monomers being polymerized, from about 0.25% to about 5.0% by weight, based on the weight of the monomer(s) being polymerized of an emulsifier selected from the group consisting of compounds having the formula

(1)



compounds having the formula

(2)



wherein R in (1) and (2) is an alkyl or chlorinated alkyl group containing from 6 to 20 carbon atoms, or an aryl-alkyl group wherein the alkyl group contains from 1 to 20 carbon atoms and more than one alkyl group can be attached to the aryl group, alkali metal salts of (1) and (2), and ammonium salts of (1) and (2), agitating said mixture at a temperature below the reactivity of the catalyst or catalysts employed therein, polymerizing said mixture in said zone at a temperature in the range of about 30° C. to about 70° C., maintaining the pH in the reaction zone in the range of about 2.0 to about 13.0 until the reaction is complete, and thereafter recovering the polymer or copolymer, whereby polymer buildup in said reaction zone is substantially reduced and wherein the polymer so produced gives enhanced plastisol bloom properties.

4,273,905

PROCESS FOR PRODUCING PROPYLENE POLYMER OR COPOLYMER

Mamoru Asada; Akinobu Shiga; Kiyoshi Matsuyama, and Masahiro Kakugo, all of Ehime, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 814,579, Jul. 11, 1977, abandoned. This application Jan. 8, 1979, Ser. No. 1,651

Claims priority, application Japan, Jul. 9, 1976, 51-82374

The portion of the term of this patent subsequent to Oct. 31, 1995, has been disclaimed.

Int. Cl.³ C08F *4/66, 10/06*

U.S. Cl. 526—142 **7 Claims**

1. A process for producing a propylene polymer or copolymer which comprises polymerizing (a) propylene or (b) a mixture of propylene and another unsaturated hydrocarbon monomer in liquid propylene in the presence of a catalyst system of

(A) a titanium trichloride composition;

(B) an organoaluminum compound having the general formula:

$$R_2AlX$$

wherein R represents an alkyl group or an aralkyl group, each containing up to 18 carbon atoms, and X represents a halogen atom; and

(C) an unsaturated carboxylic acid ester selected from the group consisting of methyl acrylate, methyl methacrylate, methyl maleate, methyl itaconate, ethyl acrylate, butyl acrylate and butyl methacrylate;

while adjusting the amount of the polymer produced to at least 8,000 g per gram of the titanium trichloride composition, wherein the molar ratios of unsaturated carboxylic acid ester (C) and organoaluminum compound (B) to titanium trichloride composition (A) are 0.01–2:1 and 1–100:1, respectively, and the titanium trichloride composition (A) is a composition obtained by reducing titanium tetrachloride with an organoaluminum compound of the general formula:

$$R'_nAlX'_{3-n}$$

wherein R′ represents a straight chain or branched chain alkyl

group, an alicyclic hydrocarbon group or an aromatic hydrocarbon group, each containing up to 18 carbon atoms, X' represents a halogen atom or a hydrogen atom, and n is a number of $1 \leqq n \leqq 3$, at a temperature of about −100° C. to about 60° C.; treating the resulting solid reduction product with an ether in an amount of about 0.05 to 3 times by mole based on the titanium trichloride contained in the solid product at a temperature of about 0° to 100° C.; contacting the resulting ether-treated solid with an aluminum compound having the general formula:

$$R''_pAlX_{3-p}$$

wherein R'' represents a straight chain or branched chain alkyl group, an alicyclic hydrocarbon group or an aromatic hydrocarbon group, each containing up to 18 carbon atoms, X represents a halogen atom, and p is a number of $1 \leqq p < 1.5$ in an amount of about 0.1 to 10 times by mole based on the titanium trichloride contained in the ether-treated solid at about room temperature to about 200° C.; and thereafter contacting the aluminum compound-treated solid with a mixture of a halogenated hydrocarbon of the general formula:

$$CH_qX_{4-q}$$

wherein X is a halogen atom and q is an integer satisfying the relationship $0 \leqq q < 4$; and an ether in amounts of 0.001 to 1.0 and 0.001 to 5 times by mole based on the titanium trichloride contained in the aluminum compound-treated solid, respectively.

4,273,906

POLYMERIZABLE ACETYLENIC OLIGOMERS

James Economy, and Mary Ann Flandera, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 956,517, Oct. 31, 1978, abandoned. This application Mar. 20, 1980, Ser. No. 132,245

Int. Cl.³ C08F *4/50, 38/00, 238/00*

U.S. Cl. 526—285 **4 Claims**

1. A soluble, polymerizable oligomer having a number average molecular weight of from about 200 to about 10,000 obtained by reacting triethynylbenzene with an oxygen-carrying amine-basic cupric salt complex catalyst in the presence of a molar excess over the monomer of an aromatic monoacetylenic capping agent.

4,273,907

BENZOIN-BONDED ORGANOPOLYSILOXANES AND METHOD FOR THE PREPARATION THEREOF

Minoru Takamizawa, Annaka; Fumio Okada, Takasaki; Yasuaki Hara, and Hisashi Aoki, both of Gunma, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jul. 18, 1979, Ser. No. 58,539

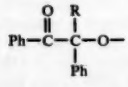
Int. Cl.³ C08G *77/04*

U.S. Cl. 528—29 **12 Claims**

1. A benzoin-bonded organopolysiloxane represented by the general formula

$$(Q)_a(R^1)_{3-p}Si—O—Si(Q)(R^2)—O]_m[Si(R^2)_2O]_n.$$
$$Si(Q)_a(R^1)_{3-a},$$

Where Q is a benzoin group represented by the general formula



Ph is a phenyl group, R is a hydrogen atom or an alkyl group having from 1 to 4 carbon atoms, R^1 is a monovalent hydrocarbon group having from 1 to 6 carbon atoms, R^2 is a substituted or unsubstituted monovalent hydrocarbon group, a is a number of 0, 1 or 2, m is 0 or a positive integer with the proviso that a and m are not simultaneously equal to zero, and n is zero or a positive integer.

4,273,908

PROCESS FOR THE PRODUCTION OF POLY (POLYISOCYANATE-POLYOL-ALKALI METAL SILICATE SOLID

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Continuation-in-part of Ser. No. 36,350, May 7, 1979, which is a continuation-in-part of Ser. No. 889,932, Mar. 27, 1978, abandoned, which is a continuation-in-part of Ser. No. 663,924, Mar. 4, 1976, Pat. No. 4,097,424, which is a continuation-in-part of Ser. No. 599,000, Jul. 7, 1975, Pat. No. 4,072,637, which is a continuation-in-part of Ser. No. 262,485, Jun. 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 71,628, Sep. 11, 1970, abandoned. This application May 5, 1980, Ser. No. 146,474

Int. Cl.³ C08J *9/00*

U.S. Cl. 528—44 **23 Claims**

1. The improved process for the production of poly (polyisocyanate-polyol-alkali metal silicate) products by mixing and reacting the following components:

(a) the improvement comprises of producing an emulsion of an alkali metal silicate, which contains only water molecules that are attached to the alkali metal silicate,

(b) an organic polyisocyanate or polyisothiocyanate.

4,273,909

ONE-PART SOLVENT-FREE THERMOSETTABLE BLOCKED PREPOLYMER COMPOSITION CONTAINING A DIENE, TOGETHER WITH CHAIN EXTENDER, CHAIN TERMINATOR AND A DIENOPHILE

Manuel J. Arco, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

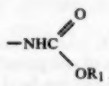
Filed Apr. 22, 1980, Ser. No. 142,651

Int. Cl.³ C08G *18/10*

U.S. Cl. 528—45 **16 Claims**

1. A one-part, solvent-free, thermosettable adhesive and coating composition, comprising in admixture:

(A) a prepolymer having terminal isocyanate substituents of the formula:



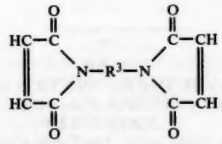
wherein R_1 is C_6H_5— or a radical of the formula $(R^2)_2C{=}N$— wherein each R^2 is the same or different and is selected from the group consisting of hydrogen atoms, aliphatic radicals of 1 to 6 carbon atoms, and phenyl radicals, and wherein said prepolymer has a number average molecular weight greater than 400 and a melting point less than 95° C.;

(B) about 50 to about 100 mole percent, based on the number of moles of said prepolymer, of at least one difunctional primary or secondary amine or difunctional primary or secondary alcohol chain extender, said chain extender being soluble in said prepolymer at 95° C.;

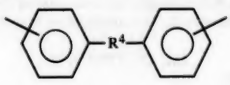
(C) up to 100 mole percent, based on the number of moles of said prepolymer, of at least one monofunctional primary or secondary amine or monofunctional primary or secondary alcohol chain terminator, said chain terminator being soluble in said prepolymer at 95° C.; and

(D) a dienophile selected from the group consisting of:

(i) bis-maleimides of the formula:

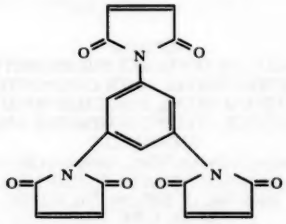


wherein R^3 is phenylene, alkylene, or a radical of the formula:



wherein R^4 is —O—, —S—, methylene, or isopropylene;

(ii) tris-maleimides of the formula:



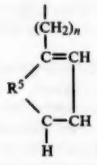
(iii) α,β unsaturated diketones having 6 to 22 carbon atoms;

(iv) diacrylates having 8 to 22 carbon atoms;

(v) α,β unsaturated dialdehydes having 8 to 22 carbon atoms; and

(vi) α,β unsaturated dinitriles having 8 to 22 carbon atoms;

wherein said dienophile is soluble in said prepolymer at 95° C., and wherein at least one of said prepolymer, said chain extender, or said chain terminator has furyl or furfuryl substituents of the formula:



wherein R^5 is a carbon, oxygen, sulfur, or nitrogen atom and n is 0 to 10, and wherein the number of moles of dienophilic sites in said dienophile is between about 10 and about 100 percent of the total number of moles of said furyl or furfuryl substituents in said prepolymer, said chain extender, and said chain terminator.

4,273,910

COLD HARDENING BINDING AGENT FOR PARTICULATE SOLIDS, SUCH AS MOLDING SAND, CONTAINING A NITROGEN BASIC POLYOL

Gernot Lederer, Speyer, Fed. Rep. of Germany, assignor to Woellner-Werke, Rhein, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 100,438, Dec. 5, 1979, abandoned. This application Mar. 19, 1980, Ser. No. 131,782

Int. Cl.³ C08G *18/38*

U.S. Cl. 528—48 **12 Claims**

1. A cold hardening binding agent for binding particulate solid materials which is obtained by mixing a polyhydroxy compound having at least two hydroxyl groups and a polyisocyanate, characterized in that the polyhydroxy compound consists at least in part of a sufficient quantity of nitrogen basic polyol to achieve hardening of the binding agent.

4,273,911

METHOD FOR THE MANUFACTURE OF LOW-MELTING POLYURETHANES HAVING IMPROVED STRENGTH PROPERTIES USING A MIXTURE OF A POLYDIOL HAVING A MOLECULAR WEIGHT BETWEEN 500 AND 5,000 AND A MIXTURE OF AT LEAST THREE DIOLS

Bertram Freudenberg; Günter Schuhmacher, both of Weinheim an der Bergstrasse, and Horst Mühlfeld, Grasellenbach, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim an der Bergstrasse, Fed. Rep. of Germany

Filed Jan. 30, 1980, Ser. No. 116,838

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1979, 2906136

Int. Cl.³ C08G *18/32*

U.S. Cl. 528—49 **26 Claims**

1. A method for preparing a polyurethane which melts below about 150° C. which comprises preparing a chain-extended polyurethane from at least one diisocyanate, at least one polydiol having a molecular weight between about 500 and 5000, and at least three diols wherein at least one diol is branched or includes an ether group, and wherein at least one diol is unbranched, said diols having a molecular weight of less than about 500; and wherein the hydroxyl group content of the reaction mixture exceeds or equals the isocyanate content of the reaction mixture.

4,273,912

POLYURETHANE FLOOR VARNISH AND FLOOR MATERIALS COATED THEREWITH

Walter L. Harmer, Arden Hills, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Sep. 24, 1979, Ser. No. 78,463

Int. Cl.³ C08G *18/32, 18/72;* B32B *27/40*

U.S. Cl. 528—67 **14 Claims**

1. A tough, wear-resistant polyurethane coating composition particularly suited for providing a protective coating on an elastomeric flooring material, said composition consisting essentially of the moisture-cured reaction product of an organic isocyanate-terminated prepolymer produced by reacting

(a) a diol component having a weighted average molecular weight between about 500 and 1200 and two primary hydroxyl groups; and

(b) sufficient diisocyanate compound having two terminal isocyanate groups to provide an NCO:OH equivalent ratio of about 1.4:1 to 2.1:1; said reacting being accomplished in the presence of sufficient compatible catalyst to facilitate the cure of said composition in a commercially acceptable period of time, said protective coating being characterized by having a Taber abraser value less than 10 milligrams average weight loss per 1000 cycles using an H-18 wheel under a 500 g load.

8. A floor material comprising a member having a traffic surface coated with a tough, wear-resistant polyurethane coating composition consisting essentially of the moisture-cured

reaction product of an organic diisocyanate-terminated prepolymer produced by reacting in the presence of a suitable catalyst

(a) a diol component having a weighted average molecular weight between about 500 and 1200 and two primary hydroxyl groups; and

(b) sufficient diisocyanate compound having two terminal isocyanate groups to provide an NCO:OH equivalent ratio of about 1.4:1 to 2.1:1, said protective coating being characterized by having a Taber abraser value less than 10 milligrams average weight loss per 1000 cycles using an H-18 wheel under a 500 g load.

4,273,913

ISOCYANATE CAPPED URETHANE-CONTAINING PREPOLYMER PREPARED FROM POLYOLS OBTAINED FROM EPIHALOHYDRIN

Louis L. Wood, Rockville, and Donald W. Larsen, Marriotsville, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

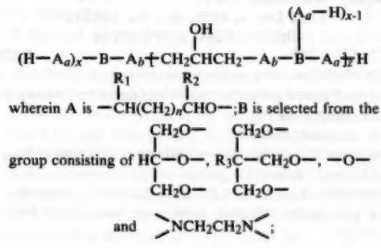
Continuation-in-part of Ser. No. 23,912, Mar. 26, 1979, abandoned. This application Dec. 13, 1979, Ser. No. 103,248

Int. Cl.³ C08G *18/10*

U.S. Cl. 528—77 **3 Claims**

1. An isocyanate capped, urethane-containing prepolymer comprising the reaction product of

(a) a polyol composition containing at least three OH groups of the general formula:



at least one of R_1 and R_2 is H and the other is independently selected from the group consisting of H, CH_3 and phenyl; R_3 is H, CH_3, CH_2CH_3 or $—OCH_2—$; n is 0 or 2; x is 1-3; z is 1-10 and a and b are independently selected from 1 to 1000 and from a stoichiometric amount up to a 20% excess per equivalent OH in the polyol of

(b) a polyisocyanate containing at least two NCO groups.

4,273,914

PRE-REACTED CARBOXYLIC ACID ANHYDRIDE COMPLEXES AS LOW TEMPERATURE CURING AGENTS FOR EPOXY RESINS

James D. B. Smith, Wilkins Township, Allegheny County, and Arthur W. Ott, Wilkinsburg, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 6, 1980, Ser. No. 127,615

Int. Cl.³ C08G *59/42, 59/68, 59/72*

U.S. Cl. 528—89 **21 Claims**

1. An electron charge transfer complex, useful as a curing agent, consisting essentially of a mixture of liquid organic carboxylic acid anhydride selected from the group consisting of monofunctional anhydrides, polyfunctional anhydrides and mixtures thereof, and Lewis Acid catalyst selected from the group consisting of $SnCl_4$, $TiCl_4$, $SbCl_5$, SbF_5, BF_3, PF_5 and mixtures thereof, forming carboxylic cationic species.

4,273,915

PROCESS FOR THE PREPARATION OF GLYCIDYL POLYETHERS OF POLYPHENOLS

Gerard Soula, Meyzieu, and Jean-Louis Locatelli, Vienne, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Feb. 29, 1980, Ser. No. 125,777

Claims priority, application France, Mar. 2, 1979, 79 05919

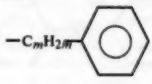
Int. Cl.³ C08G *59/06*

U.S. Cl. 528—93 **26 Claims**

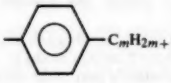
1. A process for the preparation of glycidyl polyethers of polyphenols which comprises reacting, in an anhydrous and essentially aprotic medium, at least one polyphenol alkali metal salt with at least one 2,3-epoxy-1-haloalkane in the presence of at least one compound of the formula

$$N[CHR_1—CHR_2—O—(CHR_3—CHR_4—O)_n—R_5]_3 \quad (I)$$

wherein n is an integer from 0 to 10 inclusive; R_1, R_2, R_3, and R_4, which can be the same or different, are each a hydrogen atom or an alkyl radical having 1 to 4 carbon atoms; R_5 is selected from the group consisting of a hydrogen atom, an alkyl radical having 1 to 12 carbon atoms, a cycloalkyl radical having 3 to 12 carbon atoms, a phenyl radical, a radical of the formula



and a radical of the formula



and m is an integer from 1 to 12 inclusive.

4,273,916

CURABLE CYCLOALIPHATIC EPOXY-POLYIMIDE COMPOSITIONS

Robert J. Jones, Hermosa Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Continuation-in-part of Ser. No. 12,097, Feb. 14, 1979. This application Jun. 13, 1980, Ser. No. 159,413

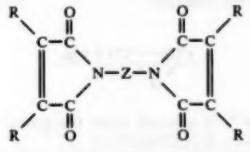
Int. Cl.³ C08G *73/10, 59/40*

U.S. Cl. 528—117 **17 Claims**

1. A low temperature curable composition comprising:

(a) at least one curable polyimide prepolymer formed at a temperature sufficient to cause thermal reaction between heated components of a mixture of:

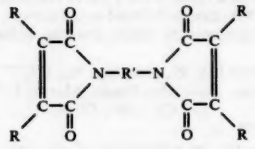
(i) at least one aliphatic bismaleimide of the formula:



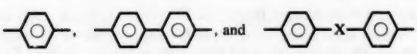
wherein Z is a polyaliphatic ether in which each aliphatic group individually contains from one to about six carbon atoms, and in which each R is independently selected from the group consisting of hydrogen, an aliphatic group containing one or two carbon atoms, a benzenoid radical and a halogen;

(ii) at least one aromatic polyamine;

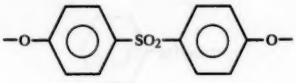
(iii) at least one aromatic bismaleimide of the formula:



wherein each R is independently selected from a group consisting of hydrogen, an aliphatic group containing one or two carbon atoms, a benzenoid radical and a halogen and wherein R' is a bifunctional benzenoid radical selected from the group consisting of:



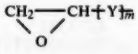
wherein X is selected from the group consisting of: —O—, —S—, —SO_2—, —CH_2—, C_2H_4—, —CO—, —C_3H_6—, and



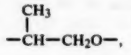
and;

(b) at least one cycloaliphatic epoxy resin having melting point less than about 120° F., containing at least two functional epoxy groups and selected from the group consisting of:

(i) epoxy resins containing one cycloaliphatic ring formed of from 4 to about 8 carbon atoms in which each epoxy group is independently part of the ring or coupled to the ring by the structure:

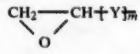


wherein Y is selected from the group consisting of —CH_2—, —CH_2CH_2O—,

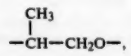


—O—, —NH—, and —S— and m is from 0 to about 20;

(ii) epoxy resins containing two fused cycloaliphatic rings each cycloaliphatic ring independently containing from 4 to about 8 carbon atoms and in which each epoxy group is independently part of a ring or coupled to a ring by the structure:

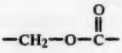


wherein Y is selected from the group consisting of —CH_2—, —CH_2O—,

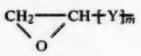


—O—, —NH—, and —S— and m is from 0 to about 20, and

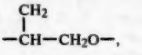
(iii) epoxy resins containing two bridged cycloaliphatic rings, each cycloaliphatic ring independently containing from 4 to about 8 carbon atoms and coupled by a carbon-carbon bond or a group selected from —O—, —CH_2—, —S— and



and in which each epoxy group is independently part of a ring or coupled to a ring by the structure:



wherein Y is selected from the group consisting of —CH_2—, —CH_2O—, —CH_2CH_2O—,



—O—. —NH—, —S— and m is from 0 to about 20.

4,273,917

ACID-TERMINATED POLYESTER IMIDE WIRE ENAMELS

Otto S. Zamek, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 4, 1979, Ser. No. 100,212
Int. Cl.³ C08G *63/44, 69/44*
U.S. Cl. 528—288 **8 Claims**

1. An electrical wire enamel comprising:

an acid-terminated polyester imide obtained by heating ingredients comprising

(a) an aromatic diamine;

(b) an aromatic carboxylic anhydride containing at least one additional carboxylic group;

(c) terephthalic acid or a reactive derivative thereof;

(d) a polyhydric alcohol having at least three hydroxyl groups;

(e) an alkylene glycol; and

(f)

(i) an alkylene glycol monoether or monoester;

(ii) a polyalkylene glycol monoether or monoester; or

(iii) a mixture of (i) and (ii),

until an acid number of not lower than 6 to 7 is attained, discontinuing the heating, and then dissolving the acid-terminated polyester imide in a solvent therefor comprising predominantly that defined under (f) above.

4,273,918

PREPARATION OF CROSSLINKED 1,2,4-OXADIAZOLE POLYMER

Robert W. Rosser; Ibrahim M. Shalhoub, both of San Jose, and Hanoi Kwong, Sacramento, all of Calif., assignors to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 28,301, Apr. 9, 1979. This application Apr. 30, 1980, Ser. No. 145,284
Int. Cl.³ C08G *73/08*
U.S. Cl. 528—310 **5 Claims**

1. A process for the preparation of a crosslinked 1,2,4-oxadiazole polymer, which comprises heating under reduced pressure at temperatures within the range of about 50° C. to about 210° C., a compound of the formula $H_2N(HON)$—R—Q, wherein: R is a bivalent organic radical selected from the class consisting of alkylene radicals of the formula —$(CX_2)_p$— and alkylether radicals of the formula

$$-CFY(OCF_2CFY)_mO(CX_2)_pO(CFYCF_2O)_n-CFY-,$$

or a mixture thereof, wherein X is fluorine or hydrogen, Y is fluorine or trifluoromethyl, p ranges from 1 to about 18, and m+n ranges from 2 to about 7; and Q is a ring-forming group selected from the class consisting of nitrile, amidine, a mixture of nitrile and amidoxime, and a mixture of amidine and amidoxime.

4,273,919

METHOD FOR PRODUCING POLYLAUROLACTAM POWDER COMPOSITIONS FOR THE COATING OF METALS AT HIGH TEMPERATURES AND THEIR USE IN THE MANUFACTURE OF PIGMENTED POWDERS BY THE DRY-BLEND PROCESS

Rainer Feldmann; Karl-Adolf Müller, and Karl-Heinz Hornung, all of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Nov. 21, 1979, Ser. No. 96,416

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1978, 2855920

Int. Cl.³ C08G *69/14, 69/16, 69/46*

U.S. Cl. 528—313 **18 Claims**

1. A method of producing polylaurolactam powders comprising:

(a) polymerizing laurolactam in the presence of about 2 to 10 percent by weight of water, based on said laurolactam, about 0.3 to 0.7 percent by weight of phosphoric acid, based on said laurolactam and at a temperature of about 265° to 300° C., in the absence of chain stabilizers under an internal pressure of about 14 to 25 bars to a polylaurolactam having a relative viscosity of about 1.50 to 1.80 measured in a 0.5 percent meta-cresol solution at 25° C.;

(b) granulating said polylaurolactam of (a);

(c) extracting said granulated polylaurolactam with ethanol or methanol at a temperature of about 25° to 100° C.;

(d) reducing to powdered form said extracted polylaurolactam of (c) at a temperature of about −100° to 0° C.; and

(e) grading and separating said powdered polylaurolactam into a grain size distribution of at least 99% by weight greater than 40 microns, but less than 250 microns.

4,273,920

POLYMERIZATION PROCESS AND PRODUCT

Robert S. Nevin, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Sep. 12, 1979, Ser. No. 75,296

Int. Cl.³ C08G *63/06, 63/04*

U.S. Cl. 528—361 **11 Claims**

1. A copolymer derived from the polymerization of about 60 to about 95 weight percent of lactic acid and about 40 to about 5 weight percent of glycolic acid, having an inherent viscosity in chloroform of about 0.08 to about 0.30 and a molecular weight of about 6000 to about 35000, said copolymer being substantially free of polymerization catalyst.

4,273,921

WATER-SOLUBLE EPOXY RESINS AND PROCESS FOR THEIR PREPARATION

James L. Bertram, and Pong Su Sheih, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 67,988, Aug. 20, 1979, abandoned, which is a continuation-in-part of Ser. No. 895,168, Apr. 11, 1978, abandoned, which is a division of Ser. No. 401,915, Sep. 28, 1978, Pat. No. 4,110,354, which is a continuation-in-part of Ser. No. 67,234, Aug. 26, 1970, abandoned, which is a continuation-in-part of Ser. No. 852,061, Aug. 21, 1969, abandoned, which is a continuation-in-part of Ser. No. 782,611, Dec. 10, 1968, abandoned. This application Apr. 21, 1980, Ser. No. 142,495

Int. Cl.³ C08G *59/04*

U.S. Cl. 528—405 **5 Claims**

1. A Water-soluble epoxy resin which is the dehydrohalogenated Lewis Acid catalyzed reaction product, in the presence of a non-aqueous inert solvent in which the glycerine is at least partially soluble and in which the resulting halohydrin ether reaction product is sufficiently soluble to form a single phase, of an epoxyalkyl halide, wherein the epoxy group is in the α, β position relative to the halogen atom, with a mixture containing

(a) from about 10% to about 75% by weight of polyhydroxyl-containing compound, other than glycerine, which is soluble in glycerine to the extent of at least about 10 percent by weight at the reaction temperature and

(b) from about 90% to about 25% by weight of glycerine;

wherein the quantity of said epoxyalkyl halide per mole of combined components (a) and (b) is in the range of from about 2.0 to about 2.6 and when the Lewis Acid is $SnCl_4$ or HF in the range of from about 2.0 to about 3.0 epoxide equivalents and the product contains less than about 2 percent by volume of water-insoluble constituents; and wherein the dehydrohalogenation is conducted in the presence of an inert solvent which will maintain at least the glycidyl ether of glycerine in solution.

4,273,922

KETOSE SUGARS FROM ALDOSE SUGARS

Kevin B. Hicks, Glenside, Pa., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 21, 1980, Ser. No. 132,595

Int. Cl.³ C07H *3/02, 3/04*

U.S. Cl. 536—1 **5 Claims**

1. A process for producing ketose sugars in high yield comprising reacting an aldose sugar and boric acid in aqueous medium in the presence of a tertiary or quaternary amine, said boric acid and aldose sugar being present in a molar ratio of about one to one.

4,273,923

PROCESS FOR PREPARING AMINOGLYCOSIDE DERIVATIVES

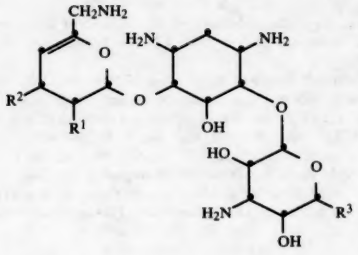
Kikuo Igarashi, Itami, and Tamio Sugawara, Mino, both of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Aug. 20, 1979, Ser. No. 68,103

Int. Cl.³ A61K *31/71;* **C07H** *15/22*

U.S. Cl. 536—10 **3 Claims**

1. A process for preparing a compound of the formula:



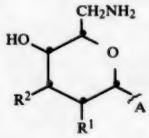
wherein

R^1 is hydroxy or amino;

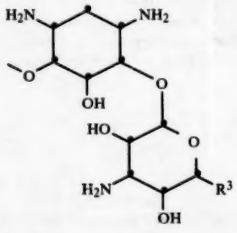
R^2 is hydrogen or hydroxy; and

R^3 is hydroxymethyl or carbamoyloxymethyl

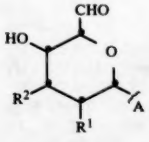
which comprises reacting an aminoglycoside of the formula:



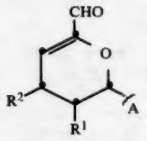
wherein A represents a group of the formula:



and in which the amino groups other than the 6'-amino group are preliminarily protected with ethoxycarbonyl group with a carbonyl compound selected from the group consisting of mesitylglyoxal, 3-nitromesitylglyoxal, and 3,5-dinitromesitylglyoxal to give the corresponding Schiff base, subjecting the latter to prototropic rearrangement on treatment with a base selected from the group consisting of triethylamine, 1,5-diazabicyclo[5.4.0]undecene-5, 1,5-diazabicyclo[3.4.0]nonene-5, sodium methoxide, and sodium ethoxide, and subsequent acid decomposition with an acid selected from the group consisting of acetic acid, oxalic acid, and pyruvic acid to give a compound of the formula:



subjecting the latter to dehydration with an acid selected from the group consisting of acetic acid, oxalic acid, and pyruvic acid to give a compound of the formula:



and subjecting the latter to reductive amination by reaction with an alcoholic ammonia or hydroxylamine and a metal hydride and to deprotection by hydrolysis.

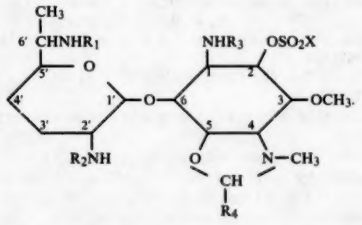
4,273,924

2-O-HYDROCARBONSULFONYL-4,5-OXAZOLIDINE FORTIMICIN B DERIVATIVES

Jerry R. Martin; John S. Tadanier, both of Waukegan, and Paulette Collum, Zion, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 863,009, Dec. 21, 1979, Pat. No. 4,192,867.
This application Apr. 27, 1979, Ser. No. 71,344
Int. Cl.³ C07H *15/22*
U.S. Cl. 536—17 R **4 Claims**

1. A compound of the formula



wherein R_1,R_2 and R_3 each are the same or different members of the group consisting of hydrogen or benzyloxycarbonyl; R_4 is selected from the group consisting of hydrogen, loweralkyl, monocyclicaryl, or aralkyl; X is a hydrocarbon having from 1 to 8 carbon atoms; and the pharmaceutically acceptable salts thereof.

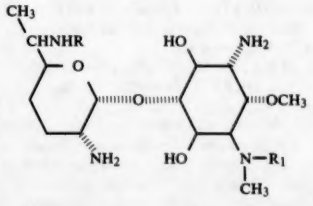
4,273,925

1,2-MODIFIED FORTIMICINS A AND B, INTERMEDIATES THEREFOR AND METHOD FOR THEIR MANUFACTURE

Jerry R. Martin; John S. Tadanier, both of Waukegan, and Paulette Johnson, Zion, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Sep. 26, 1979, Ser. No. 79,135
Int. Cl.³ C07H *15/22*
U.S. Cl. 536—17 R **17 Claims**

1. A 2-amino-1-deamino-2-deoxy-1-hydroxyfortimicin represented by the formula



wherein R is hydrogen or loweralkyl; and R_1 is selected from

the group consisting of hydrogen, loweralkyl, aminoloweralkyl, diaminoloweralkyl, N-loweralkylaminoloweralkyl, N,N-diloweralkylaminoloweralkyl, hydroxyloweralkyl, aminohydroxyloweralkyl, N-loweralkylaminohydroxyloweralkyl, N,N-diloweralkylaminhydroxyloweralkyl, acyl of the formula

wherein R_2 is loweralkyl, aminoacyl, hydroxyacyl, hydroxysubstituted aminoacyl, diaminoacyl, hydroxy-substituted diaminoacyl, hydroxy-substituted N-loweralkylaminoacyl and hydroxy-substituted N,N-diloweralkylaminoacyl wherein each acyl is of the formula

R_2 being loweralkyl; and the pharmaceutically acceptable salts thereof.

4,273,926

AZO DYES FROM 2-AMINO-5-STYRYL-1,3,4-THIADIAZOLES

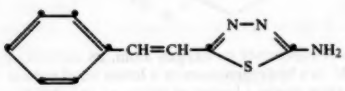
Mark D. Frishberg, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 6,965, Jan. 25, 1979. This application Feb. 8, 1980, Ser. No. 119,697

Int. Cl.³ C07D *285/12*

U.S. Cl. 542—458 **1 Claim**

1. The process for the preparation of the compound



comprising reacting in water at from about 40° to about 100° C., ferric ammonium sulfate dodecahydrate and cinnamaldehyde thiosemicarbazone wherein the reactants are present in a mole ratio of from about 1:1 to about 5:1.

4,273,927

CONVERTING ENZYME INHIBITOR

Ralph L. White, Jr., and David E. Portlock, both of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Aug. 14, 1980, Ser. No. 177,905

Int. Cl.³ C07D *513/04*

U.S. Cl. 544—32 **1 Claim**

1. The compound 5,6-dihydro[1,4]thiazino[4,3-a]quinoline-1(2H),4(4aH)-dione.

4,273,928

PREPARATION OF SALTS OF DIHALOGENATED ISOCYANURATES BY OXIDATIVE HYDROLYSIS OF AMINO SUBSTITUTED TRIAZINES

Sidney Berkowitz, Highland Park, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Sep. 8, 1976, Ser. No. 721,297

Int. Cl.³ C07D *251/26, 251/32, 251/34, 251/36*

U.S. Cl. 544—190 **21 Claims**

1. A process for preparing a salt of dihalogenated isocyanurate from an amino substituted triazine selected from the group consisting of melamine; ammeline, ammelide, ammeline:ammelide complex, cyanuric acid:malamine complex, and crude cyanuric acid, which comprises:

reacting the amino substituted triazine with at least stoichiometric amounts of a halogen containing compound selected from the group consisting of sodium hypochlorite, lithium hypochlorite, potassium hypochlorite, sodium hypobromite, lithium hypobromite, potassium hypobromite, and calcium hypochlorite in an aqueous medium at a temperature of 35° to 70° C., and at a pH value of 6.5 to 11.0 for less than about five minutes to completely N-halogenate all of the available sites on the triazine molecule that can be N-halogenated and to remove any N, N-dihalogenated exocyclic nitrogens;

cooling the reaction medium to precipitate a salt of a dihalogenated isocyanurate; and

recovering the salt of a dihalogenated isocyanurate.

4,273,929

HETEROCYCLIC COMPOUNDS

Arthur Boller, Binningen; Martin Schadt, Seltisberg, and Alois Villiger, Basel, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

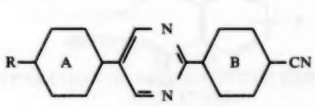
Filed Jan. 29, 1980, Ser. No. 116,518

Claims priority, application Switzerland, Feb. 5, 1979, 1102/79; Jun. 27, 1979, 5996/79; Nov. 13, 1979, 10126/79

Int. Cl.³ C09K *3/34*; G02F *1/13*; C07D *239/26*

U.S. Cl. 544—242 **7 Claims**

1. A compound of the formula



I

wherein at least one of the rings A and B is a trans-1,4-disubstituted cyclohexane ring and the other optionally is aromatic and R is straight-chain alkyl or alkoxy of 1 to 10 carbon atoms or a branched-chain alkyl of the formula C_2H_5—(CH(CH-3)—$(CH_2)_n$—wherein n is 1, 2 or 3.

4,273,930

4-HYDROXY-2-QUINOLINONE-3-CARBOXYLIC ACID ESTERS

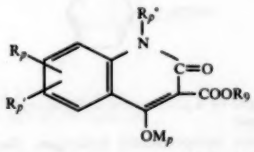
Goetz E. Hardtmann, Morristown, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 807,898, Jun. 20, 1977, Pat. No. 4,190,659, which is a continuation-in-part of Ser. No. 662,148, Feb. 27, 1976, abandoned, which is a continuation-in-part of Ser. No. 557,984, Mar. 12, 1975, abandoned, which is a division of Ser. No. 454,070, Mar. 25, 1974, abandoned, which is a continuation-in-part of Ser. No. 303,099, Nov. 2, 1972, abandoned, and Ser. No. 392,082, Aug. 27, 1973, abandoned. This application Aug. 9, 1979, Ser. No. 65,278

Int. Cl.³ C07D *215/56, 491/04*

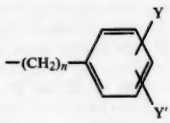
U.S. Cl. 546—90 **42 Claims**

1. A compound of the formula:



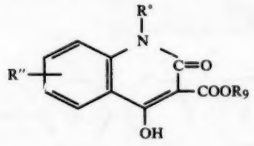
wherein R_9 is alkyl of 1 to 4 carbon atoms, wherein

R_p° is alkenyl of 3 to 6 carbon atoms, alkynyl of 3 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, cycloalkylalkyl in which the cycloalkyl is of 3 to 6 carbon atoms and the alkyl portion is of 1 or 2 carbon atoms, or



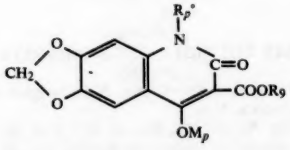
M_p is hydrogen or a pharmaceutically acceptable cation,
n is 0 or 1,
Y and Y' are independently hydrogen, fluoro, chloro, bromo, alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 3 carbon atoms, trifluoromethyl or nitro with the proviso that only one of Y and Y' can be from the group of nitro and trifluoromethyl, and
R_p and R_p' are independently hydrogen, fluoro, chloro, bromo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, nitro or trifluoromethyl, with the proviso that only one of R_p and R_p' can be from the group consisting of nitro and trifluoromethyl,
with the further proviso that the unsaturation in any alkenyl or alkynyl is on other than the alpha carbon atom.

21. A compound of the formula:

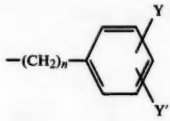


wherein
R^o is alkyl of 1 to 6 carbon atoms,
R'' is hydrogen, fluoro, chloro, bromo or alkoxy of 1 to 4 carbon atoms, and
R_9 is alkyl of 1 to 4 carbon atoms.

32. A compound of the formula:



wherein R_9 is alkyl of 1 to 4 carbon atoms, wherein
R_p^o is hydrogen, alkyl of 1 to 6 carbon atoms, alkenyl of 3 to 6 carbon atoms, alkynyl of 3 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, cycloalkylalkyl in which the cycloalkyl is of 3 to 6 carbon atoms and the alkyl portion is of 1 or 2 carbon atoms, or



M_p is hydrogen or a pharmaceutically acceptable cation,
n is 0 or 1, and
Y and Y' are independently hydrogen, fluoro, chloro, bromo, alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 3 carbon atoms, trifluoromethyl or nitro, with the proviso that only one of Y and Y' can be from the group consisting of nitro and trifluoromethyl,
with the further proviso that the unsaturation in any alkenyl or alkynyl is on other than the alpha carbon atom.

4,273,931
REDUCTION OF ALKYL ESTERS OF CARBONIC-CARBOXYLIC ANHYDRIDES TO ALCOHOLS

Aldo Garzia, Lodi; Giorgio Vittadini, Milan; Andrea Bottazzi, Lodi; Domenico Pelagalli, Lodi, and Costantino Coccoli, Lodi, all of Italy, assignors to Istituto Chemioterapico Italiano, S.p.A., Milan, Italy

Filed Dec. 20, 1979, Ser. No. 105,537
Int. Cl.³ C07C *33/20*
U.S. Cl. 546—344 **8 Claims**

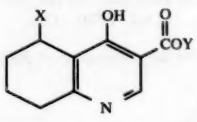
1. A method of making alcohols which comprises reducing an alkyl ester of a carbonic-carboxylic acid anhydride with hydrogen at temperatures of at least about 40° C. and elevated pressure, and in the presence of a catalyst comprising platinum group metal on a solid carrier.

4,273,932
4-HYDROXY-5,6,7,8-TETRAHYDROQUINOLINE-3-CARBOXYLIC ACIDS AND DERIVATIVES

Akira Matsubara, Yokohama; Hideaki Sakai, Fujisawa; Makoto Odate, and Takuo Nakano, both of Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Jan. 29, 1980, Ser. No. 116,560
Claims priority, application Japan, Mar. 9, 1979, 54/26748
Int. Cl.³ C07D *215/56, 499/68;* A61K *31/47*
U.S. Cl. 546—156 **16 Claims**

1. Quinoline derivative having the general formula:



wherein X represents an oxygen atom, an =NOR¹ group in which R^1 is a hydrogen atom or a lower alkyl radical of from 1 to 5 carbon atoms, a hydroxyl group, or an —NHR² group in which R^2 is either a hydrogen atom or an R^1CO— group in which R^1 is a lower alkyl radical of from 1 to 5 carbon atoms, and wherein Y represents a hydrogen atom, a lower alkyl radical of from 1 to 5 carbon atoms, or a salt-forming radical selected from the group consisting of inorganic salt-forming radicals and organic salt-forming radicals.

4,273,933
MODIFIED CATALYST FOR STEREO-DIFFERENTIATING REDUCTION OF CARBONYL COMPOUNDS AND PROCESS FOR REDUCTION WITH SAME CATALYST

Tadao Harada, Takarazuka; Yoshiharu Izumi, Kobe, and Shinichiro Komatsu, Kawagoe, all of Japan, assignors to Kawaken Fine Chemicals Co., Ltd., Tokyo, Japan

Filed Apr. 25, 1979, Ser. No. 33,150
Int. Cl.³ C07C *69/675, 31/26, 31/20, 33/26*
U.S. Cl. 560—179 **4 Claims**

1. A process for stereo-differentially reducing a carbonyl compound, wherein the carbonyl compound is contacted with a modified nickel catalyst prepared by soaking a nickel catalyst in an aqueous modifying medium having dissolved therein at least one optically active substance selected from the group consisting of optically active hydroxycarboxylic acids and optically active amino acids, and, then, separating the so-treated catalyst from the aqueous modifying medium, characterized in that the aqueous modifying medium has dissolved therein, in addition to the optically active substance, at least one inorganic salt said inorganic salt being contained in the modifying medium in an amount of from 0.006 to 25 times, by weight, based on the amount of metallic nickel in said nickel catalyst.

4,273,934

PREPARATION OF 3-HYDROXY-2,2,4-TRIMETHYLPENTYL ISOBUTYRATE

Franz Merger, Frankenthal, and Hans-Juergen Foerster, Bobenheim-Roxheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 17, 1979, Ser. No. 31,013

Claims priority, application Fed. Rep. of Germany, May 11, 1978, 2820518

Int. Cl.[3] C07C *67/00, 69/28*

U.S. Cl. 560—238 8 Claims

1. A process for the preparation of 3-hydroxy-2,2,4-trimethylpentyl isobutyrate by reacting isobutyraldehyde in the presence of a basic compound and water, wherein isobutyraldehyde is reacted in the presence of from 1.5 to 5 percent by weight, based on isobutyraldehyde, of a carboxylic acid selected from the group consisting of isobutyric acid, 2,2,4-trimethyl-3-hydroxy-pentanoic acid, 2-ethylhexanecarboxylic acid, benzoic acid, phenylpropionic acid and α-methylpentanecarboxylic acid in the form of the free acid, or an alkali metal salt and/or alkaline earth metal salt thereof, and in the presence of from 0.01 to 0.1 mole of an alkaline earth metal hydroxide selected from the group consisting of barium hydroxide, strontium hydroxide and calcium hydroxide and from 0.04 to 1 mole of water per mole of isobutyraldehyde, for a reaction time of from 10 to 300 minutes.

4,273,935

SALTS OF PROPENE 1,1,2,3-TETRACARBOXYLIC ACID

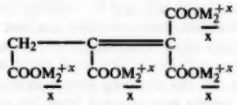
Eddie N. Gutierrez, Fort Lee, and Vincent Lamberti, Upper Saddle River, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 905,720, May 15, 1978, abandoned, which is a division of Ser. No. 642,850, Dec. 22, 1975, Pat. No. 4,123,458. This application Sep. 12, 1979, Ser. No. 74,702

Int. Cl.[3] C07C *57/02*

U.S. Cl. 562—595 2 Claims

1. A propene 1,1,2,3-tetracarboxylate salt of the formula



wherein M_2 is a lithium, sodium, potassium, calcium, strontium or barium cation and wherein x is 1 or 2 and is equivalent to the valency of M_2.

4,273,936

RHODIUM-CATALYZED OXIDATION PROCESS FOR PRODUCING CARBOXYLIC ACIDS

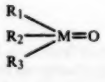
Rocco A. Fiato, Charleston, W. Va., and Roy L. Pruett, New Providence, N.J., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 79,884, Sep. 28, 1979, abandoned. This application Jun. 16, 1980, Ser. No. 159,859

Int. Cl.[3] C07C *53/122, 51/145, 51/235*

U.S. Cl. 562—606 24 Claims

1. A process for preparing at least one of a carboxylic acid and its anhydride directly from an olefin comprising reacting the olefin with carbon monoxide, hydrogen and oxygen in the presence of a rhodium complex catalyst consisting essentially of rhodium stabilized by a pentavalent Group V ligand represented by the formula



wherein R_1, R_2 and R_3, which may be the same or different, each represents a member selected from the group consisting of an alkyl group, an aryl group, an alkyl-substituted aryl group and an aryl-substituted alkyl group; and wherein M represents a Group V element selected from the group consisting of phosphorus, arsenic and antimony.

4,273,937

ORGANIC AMINE COMPOSITIONS

Mary L. Gum, Granite Springs, and Nancye D. Kearns, Ossining, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 19, 1979, Ser. No. 105,243

Int. Cl.[3] C07C *85/26;* C07D *295/02, 265/30, 213/02*

U.S. Cl. 564—2 13 Claims

1. Organic amine compositions which are substantially free from nitrosamine contaminants comprising an organic amine and a small inhibiting amount of an inhibiting additive which is a member selected from the group consisting of 1,4-naphthoquinone, 1,4-naphthohydroquinone, alkyl-substituted derivatives of said quinones, and mixtures of the same.

4,273,938

PREPARATION OF N-SUBSTITUTED CARBOXYLIC ACID AMIDES

Franz Merger, Frankenthal; Gerhard Nestler, Ludwigshafen, and Uwe Kempe, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

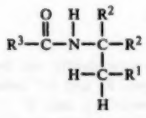
Filed Jan. 25, 1979, Ser. No. 6,524

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1978, 2807659

Int. Cl.[3] C07C *102/08, 102/00*

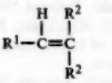
U.S. Cl. 564—124 13 Claims

1. A process for the preparation of an N-substituted carboxylic acid amide of the formula



I

where R^1 and the individual radicals R^2 are identical or different and each is an aliphatic radical, two of the radicals R^1 and R^2 can also each be hydrogen, and R^3 is hydrogen or an aliphatic, araliphatic or aromatic radical, by reaction of an olefin with a cyano compound, wherein an olefin of the formula



II

where R^1 and R^2 have the above meanings, is reacted with a cyano compound of the formula

R^3CN III

where R^3 has the above meaning, and with water, in the presence of from 10 to 80 percent by weight, based on starting material II, of an organic cation exchanger containing sulfonic acid groups.

4,273,939

PROCESS FOR HYDROGENATING ORGANIC COMPOUNDS BY USE OF NON-FERROUS GROUP VIII ALUMINUM COPRECIPITATED CATALYSTS

Allan E. Barnett, and Albert P. Halluin, both of Westfield, N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Nov. 6, 1979, Ser. No. 91,836
Int. Cl.[3] C07C *85/12, 5/10, 29/14;* C11C *3/12*
U.S. Cl. 564—358 18 Claims

1. A process for hydrogenating organic compounds which comprises contacting at least one hydrogenatable organic compound with hydrogen in the presence of a supported coprecipitated catalyst consisting essentially of one or more metals selected from the non-ferrous metals of Group VIII of the Periodic Table of the Elements, aluminum and solid porous particles, said catalyst being characterized as having a B.E.T. total surface area ranging from about 150 to about 350 m^2/g wherein the total amount of metal in the catalyst ranges from about 25 wt. % to about 70 wt. % based on the total weight of the catalyst after calcination and reduction, and wherein said catalyst has been prepared by coprecipitating aluminum ions and ions of said one or more metals, with the solid porous particles.

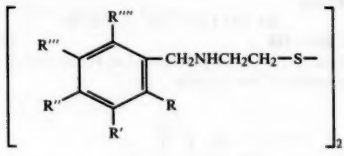
4,273,940

BIS-(2-BENZYLAMINOETHYL)-DISULFIDES

Fortuna Haviv, Vernon Hills, and George W. Carter, Mundelein, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 86,854, Oct. 22, 1979, abandoned, which is a continuation-in-part of Ser. No. 962,513, Nov. 20, 1978, abandoned. This application May 13, 1980, Ser. No. 149,390
Int. Cl.[3] C07C *87/28*
U.S. Cl. 564—372 16 Claims

1. A compound of the formula



wherein R and R'''' independently are hydrogen, hydroxy, loweralkyloxy or halogen, R' and R''' independently are hydrogen, halogen or loweralkyl, and R'' is hydrogen or hydroxy, with the proviso that at least one of these substituents is different from hydrogen or loweralkyl, or a nontoxic acid addition salt thereof.

4,273,941

PROCESS FOR PRODUCING P-HYDROXYBENZALDEHYDE

Masao Kawamura, Akashi; Tadaaki Nishi, Kakogawa; Kunioki Kato, Akashi; Hiroshi Mizokami, Kakogawa, and Tadashi Kanazawa, Hyogo, all of Japan, assignors to Seitetsu Kagaku Co., Ltd., Hyogo, Japan

Division of Ser. No. 938,125, Aug. 30, 1978, Pat. No. 4,195,041. This application Jul. 6, 1979, Ser. No. 55,414
Claims priority, application Japan, Sep. 7, 1977, 52-108084; Sep. 7, 1977, 52-108085; Sep. 8, 1977, 52-108552; Oct. 3, 1977, 52-119355
The portion of the term of this patent subsequent to Mar. 25, 1997, has been disclaimed.
Int. Cl.[3] C07C *85/11, 89/00*
U.S. Cl. 564—416 12 Claims

1. In a process for producing p-aminobenzaldehyde from p-nitrotoluene comprising reacting p-nitrotoluene with sodium polysulphide in a mixed solvent consisting of at least one alcohol and an alkali aqueous solution in the presence of an aprotic polar compound to produce the p-aminobenzaldehyde.

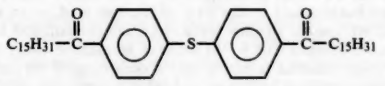
4,273,942

PLASTICIZED POLYCARBONATE COMPOSITION

Victor Mark, Evansville, Ind., and Phillip S. Wilson, Louisville, Ky., assignors to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 37,922, May 9, 1979, which is a continuation-in-part of Ser. No. 957,353, Nov. 3, 1978, abandoned, which is a division of Ser. No. 781,054, Mar. 24, 1977, Pat. No. 4,184,994. This application Jun. 12, 1980, Ser. No. 158,647
Int. Cl.[3] C07C *49/76*
U.S. Cl. 568—42 1 Claim

1. A novel compound having the formula:



4,273,943

PROCESS FOR PREPARING METHYLVANILLYL KETONE FROM ISOEUGENOL

George Gal, Watchung, and Seemon H. Pines, Murray Hill, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 28, 1979, Ser. No. 79,750
Int. Cl.[3] C07C *45/58, 67/08*
U.S. Cl. 568—319 5 Claims

1. A process for preparing methylvanillyl ketone in a single step, through process comprising:

oxidizing isoeugenol with an oxidation reagent selected from the group consisting of peroxides, peracids, iodine-silver oxide, iodine-mercuric oxide, N-bromosuccinimide-perchloric acid or thallium triacetate in an aqueous solution of an organic acid selected from the group consisting of C_{1-5} alkanoic acid, trifluoroacetic acid and trichloroacetic acid at a temperature of about 25°–100° C. to form a glycol monoester; and

converting in situ the resulting glycol monoester by refluxing with a strong acid selected from the group consisting of sulfuric acid, alkyl or aryl sulfonic acid, hydrochloric acid, hydrobromic acid, and phosphoric acid in an inert solvent to obtain said methylvanillyl ketone therefrom without isolation of any intermediates.

4,273,944

METHOD FOR SELECTIVE PREPARATION OF CIS ISOMERS OF ETHYLENICALLY UNSATURATED COMPOUNDS

Shigeru Ohno, Kanagawa; Haruya Tezuka, Omiya, and Toshinobu Ishihara, Niigata, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Oct. 30, 1979, Ser. No. 89,466
Claims priority, application Japan, Nov. 8, 1978, 53-137543
Int. Cl.[3] C07C *5/09, 45/62, 29/17*
U.S. Cl. 568—396 6 Claims

1. A method for the selective preparation of the cis isomer of a disubstituted ethylenically unsaturated compound by the partial hydrogenation of a disubstituted acetylenically unsaturated compound which comprises pressurizing a disubstituted acetylenically unsaturated compound having the formula

$$R^1C{\equiv}CR^2$$

wherein R^1 and R^2 contain from 1 to 20 carbon atoms and are each a hydrocarbon radical selected from the group consisting of alkyl, cycloalkyl, alkenyl and aryl, each of which may be substituted with hydroxy, carboxyl, aldehyde, or carbonyl

with hydrogen in the presence of a catalyst containing from 3% to 15% by weight of palladium borne on an alumina carrier and partially inactivated with a poisoning element selected from the group consisting of zinc, lead and tin, water and a hydroxide or a basic salt selected from the group consisting of carbonate, hydrogen carbonate or acetate of a metallic element selected from the group consisting of alkali metals and alkaline earth metals and wherein the reaction of partial hydrogenation is carried out at a temperature in the range from 20° to 200° C. and under a hydrogen pressure in the range from 1 to 100 kg/cm^2G.

4,273,945

PREPARATION OF SATURATED ALIPHATIC, CYCLOALIPHATIC AND ARALIPHATIC ALDEHYDES

Gerd Heilen, Speyer; Axel Nissen, Leimen; Wolfgang Köernig, Dossenheim; Michael Horner, Neustadt; Werner Fliege, Otterstadt, and Güenter Boettger, Bad Durkheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 5, 1979, Ser. No. 54,889

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1978, 2832699

Int. Cl.³ C07C *45/62*

U.S. Cl. 568—420 **3 Claims**

1. In a process for the preparation of saturated aliphatic, cycloaliphatic and araliphatic aldehydes by selective hydrogenation of the corresponding olefinically unsaturated aldehydes with hydrogen in the liquid phase over a palladium-containing catalyst at a pressure of from 1 to 100 bar and at a temperature of from 20° to 250° C., the improvement which comprises using a catalyst in which the active constituents consist essentially of

(a) 2–90% by weight of palladium and

(b) 10–98% by weight of an oxide or salt of a rare earth metal or a mixture consisting essentially of oxides and/or salts of rare earth metals, the weight ratio of Pd to rare earth metal being from 2:98 to 90:10.

4,273,946

FIBER LUBRICANTS DERIVED FROM THE OXYALKYLATION OF A GLYCEROL-1,3-DIALKYLETHER

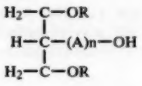
David D. Newkirk, and Robert B. Login, both of Woodhaven, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Division of Ser. No. 956,052, Oct. 30, 1978, Pat. No. 4,217,390. This application Oct. 10, 1979, Ser. No. 83,466

Int. Cl.³ C07C *43/11*

U.S. Cl. 568—625 **5 Claims**

1. A compound useful as a synthetic fiber lubricant having the structural formula:



wherein R is an alkyl radical having about 3 to about 22 carbon atoms; A is a mixture of the residues of ethylene oxide and at least one other lower alkylene oxide; n has a value to produce a molecular weight of about 300 to about 3000; and said compound is derived by oxyalkylating the reaction product of an epihalohydrin and a fatty alcohol.

4,273,947

HYDROGENATION OF FLUORINE-CONTAINING CARBOXYLIC ACIDS

Miroslav Novotny, Denville, N.J., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Jan. 31, 1979, Ser. No. 7,875

Int. Cl.³ C07C *31/38, 31/40*

U.S. Cl. 568—842 **7 Claims**

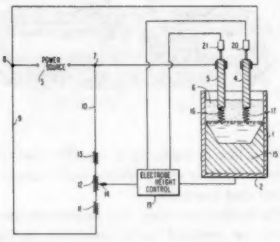
1. A process for hydrogenating the carboxy group in 2,2,2-trifluoroacetic acid to the primary alcohol group comprising the step of contacting said acid in the liquid phase with an atmosphere containing hydrogen gas in the presence of a supported or unsupported solid rhodium or iridium catalyst, employed as the metal, metallic oxide, or mixture thereof; at temperature of about 50°–150° C. and pressure of about 5–15 atmospheres.

4,273,948

ELECTRODE HEIGHT CONTROL IN ELECTRO-SLAG REMELTING PROCESSES

Pasquale Masucci, Rome, and Paolo Sommovigo, Pomezia, both of Italy, assignors to Centro Sperimentale Metallurgico S.p.A., Rome, Italy

Filed Oct. 24, 1979, Ser. No. 87,868
Claims priority, application Italy, Oct. 31, 1978, 51713 A/78
Int. Cl.[3] H05B *3/60*
U.S. Cl. 13—9 ES 2 Claims



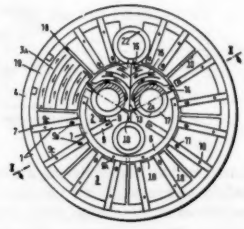
2. Apparatus for controlling the position of the two electrodes in electro-slag remelting processes, comprising an independent descent control mechanism for each of the electrodes, means connecting the two electrodes in series with a relatively high electric potential sufficient to conduct electro-slag remelting and in parallel with a relatively low electric potential and with a group of three resistances that are in series with each other, a slider on the central resistance by which the central resistance is variable according to the position of said slider thereon, means for establishing a potential of the slider characteristic of equal distance of the lower ends of the two electrodes from the metal undergoing electro-slag remelting, and means for selectively individually altering the descent of one of the electrodes in the course of electro-slag remelting, to maintain said predetermined potential substantially constant.

4,273,949

ARC FURNACE ROOF

Otto Fischer; Wilfried Pulvermacher, and Bernd Koch, all of Bochum, Fed. Rep. of Germany, assignors to Fried. Krupp Hüttenwerke Aktiengesellschaft, Bochum, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 30,862, Apr. 17, 1979, abandoned. This application Jul. 24, 1979, Ser. No. 60,182
Int. Cl.[3] F27D *1/02, 1/12*
U.S. Cl. 13—35 6 Claims



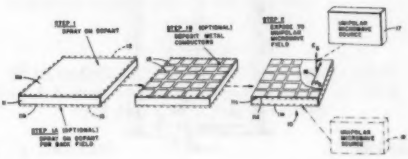
1. An arc furnace roof formed by an annular outer group of metal segments and an inner circular group of metal segments and overhead means for individually suspending the segments to form a roof structure, the segments not being otherwise held to each other, the segments of the inner group being shaped as circular sectors and having interfacing radial side walls of which at least two have semicircular side wall portions cooperatively forming at least one arcing electrode passage and having a refractory electrically insulating bushing in said passage, each of the segments of the inner group being hollow and having at least one cooling fluid inlet and outlet and internally containing a series of baffles for guiding cooling fluid as alternately reversing flows extending from the inlet to the outlet, and each having a bottom wall exposed to the interior of an arc furnace using the roof and which is free from refractory thermal insulation.

4,273,950

SOLAR CELL AND FABRICATION THEREOF USING MICROWAVES

Sanjiv R. Chitre, Reseda, Calif., assignor to Photowatt International, Inc., Tempe, Ariz.

Filed May 29, 1979, Ser. No. 43,149
Claims priority, application France, Dec. 9, 1977, 7737769
Int. Cl.[3] H01L *31/04;* H01G *9/20;* H01L *21/225*
U.S. Cl. 136—255 8 Claims



1. A process for making solar cells or like junction devices comprising:

providing a dopant adjacent the surface of a polycrystalline silicon semiconductor substrate, and

exposing said dopant and substrate to a unipolar microwave field so as to drive atoms from said dopant into said substrate to a selected depth, while controlling one or more of the microwave field parameters of frequency, power, duty cycle and on/off time so as to obtain said selected depth, and wherein:

said parameters are selected so that said dopant atoms are driven into grains of said substrate to a depth sufficient to form a shallow junction therein, concurrent drive-in of dopant atoms into grain boundaries of said substrate being insufficient to convert said boundaries to conductive short circuits for said shallow junction, the dopant level of said grain boundaries being lower than that of said grains.

4,273,951

OIL-FILLED CABLE POTHEAD WITH VENTING MEANS AND TOOL THEREFOR

Anthony N. Terreri, 340 Hillside Ave., Livingston, N.J. 07039

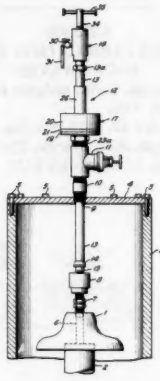
Filed Oct. 9, 1979, Ser. No. 82,966
Int. Cl.[3] H02G *15/22*
U.S. Cl. 174—11 BH 18 Claims

6. An oil filled cable termination comprising a pothead secured to the end of said cable, said pothead having a channel communicating with said cable and extending to the exterior of said pothead for conveying oil from said cable, a first valve connected to said channel, said first valve having a manually operable control member and said first valve being connected to said channel so that said control member is urged to its closed position by oil in said channel, a gas tight tank surrounding said pothead, and a manually operable valve with a through passageway, said last-mentioned valve being mounted on a wall of said tank opposite to and spaced from said first valve, but with its said passageway aligned with said first valve to permit operation of said control member and opening of said first valve through said passageway.

12. A tool for providing a connection with a valve within a gas tight enclosure, said enclosure having a through passageway which may be opened and closed, said tool comprising:

a mounting unit adapted to be secured to said enclosure at the exterior end of said passageway;

a relatively long and narrow tube in fluid-tight engagement with said mounting unit but movable longitudinally with respect to said mounting unit, said tube having a length sufficient to extend from said valve to the side of said mounting unit remote from said valve, said tube having means at one end thereof for securing it to said valve and having means at the other end thereof for closing said



other end of said tube, said means for closing said other end of said tube comprising a housing secured to said other end of said tube, said housing having a cavity in fluid communication with the interior of said tube; and

a rod extending through said housing and into said tube, said rod being movable lengthwise with respect to said housing and said tube and having a length sufficient to extend from said housing to at least said one end of said tube.

4,273,952

BUS BAR FOR A CARD FRAME FOR CIRCUIT CARDS

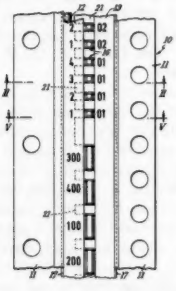
Harald Weiss, Bremen-Arnsten, Fed. Rep. of Germany, assignor to Vero Electronics GmbH, Bremen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 790,558, Apr. 25, 1977, abandoned. This application Dec. 18, 1978, Ser. No. 970,802

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1976, 7613433[U]

Int. Cl.³ H02G *5/00*

U.S. Cl. 174—68 B **5 Claims**



1. A bus bar for a card frame for receiving circuit cards, said bus bar comprising a carrier having a recess of U-section, an electrically insulating housing press fitted into said recess and having side walls which are relatively movable, and a plurality of electrically conducting strips, separated by electrically insulating foils, the strips being disposed side by side within the housing and held therein by lateral pressure from said housing.

4,273,953

SPLICE FOR LEAD-SHEATHED CABLE

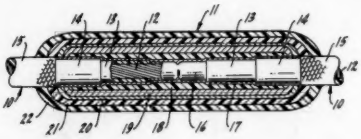
Raymond L. Guzy, Morton Grove, Ill., assignor to Centrilift, Inc., Tulsa, Okla.

Filed Jan. 18, 1979, Ser. No. 4,256

The portion of the term of this patent subsequent to Nov. 18, 1997, has been disclaimed.

Int. Cl.³ H02G *15/18*

U.S. Cl. 174—84 R **7 Claims**



1. A cable splice comprising a metallic sleeve member extending over conductor end portions and frictionally engaging the conductor end portions;

a layer of adhesive covering said sleeve member and extending over the exposed cable insulation and exposed lead sheath;

an insulation layer of uncured thermosetting elastomeric polymer tape surrounding said layer of adhesive in a helical wrap;

an overlapped layer of fabric surrounding said insulation layer;

an overlapped layer of foil surrounding said layer of fabric;

a helically-wrapped layer of heat-shrinkable polymeric material tape surrounding said layer of foil; and

a sleeve of heat-shrinkable polymeric material surrounding the layer of heat-shrinkable polymeric material tape.

4,273,954

COORDINATE READING DEVICE

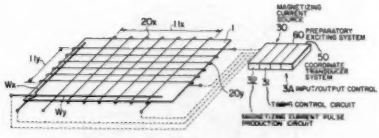
Shinziro Takeuchi; Toshiro Kikuchi; Norio Mitsumoto; Toyoki Takahashi; Hidekatsu Hayashi, and Satoshi Ichioka, all of Toda, Japan, assignors to Mishima Kosan Co., Ltd., Fukuoka, Japan

Filed Nov. 24, 1978, Ser. No. 963,264

Claims priority, application Japan, Nov. 25, 1977, 52/141356; Apr. 29, 1978, 53/51166

Int. Cl.³ G08C *21/00*

U.S. Cl. 178—19 **10 Claims**



1. In a coordinate reading device having a coordinate reading means including magnetostrictive vibration transmission media of a magnetostrictive material to attain coordinate readings along at least one dimension thereof upon the operation of a manual switch, the improvement comprising:

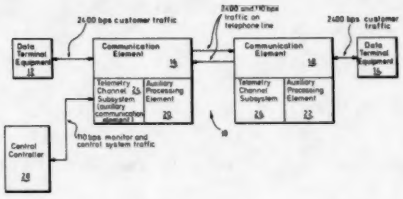
at least one fixed magnetizing coil mounted adjacent at least one surface of said vibration transmission media to substantially uniformly magnetize an effective coordinate reading region of the media, and

at least one magnetizing current supply means to apply magnetizing current to said at least one fixed magnetizing coil.

4,273,955
SYSTEM FOR IN-SERVICE QUANTITATIVE PERFORMANCE ANALYSIS OF DATA COMMUNICATIONS SYSTEM

Thomas R. Armstrong, Largo, Fla., assignor to Paradyne Corporation, Largo, Fla.

Filed Mar. 2, 1979, Ser. No. 17,041
Int. Cl.³ G06F *11/00*; H04J *1/10*; H04B *1/72*; H04M *1/24*
U.S. Cl. 178—69 G **4 Claims**

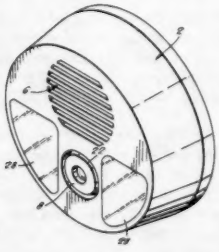


1. A data communications system comprising: first data terminal equipment provided at a first location; second data terminal equipment provided at a second location; first communications equipment at said first location interconnected with said first data terminal equipment; second communications equipment at said second location interconnected with said second data terminal equipment; a communications channel interconnecting said first and second communications equipment; a first auxiliary signal processor at said first location interfaced with said first communications equipment; a second auxiliary signal processor at said second location interfaced with said second communications equipment, said auxiliary signal processors being adapted to compute and store information relating to the performance of the communications channel; a central controller; first auxiliary communications equipment at said first location interfaced with said first auxiliary signal processor; second auxiliary communications equipment at said second location interfaced with said second auxiliary signal processor; and a communications link interconnecting said first and second auxiliary communications equipment with said central controller.

4,273,956
AUDIOSCOPE PROJECT

Maynard F. Wolfe, Hong Kong, Hong Kong, assignor to Jag International Sales Limited, Hong Kong

Filed Oct. 2, 1978, Ser. No. 948,055
Claims priority, application United Kingdom, Oct. 3, 1977, 41035/77
Int. Cl.³ H04M *11/00*
U.S. Cl. 179—1 H **9 Claims**



1. An audio-visual caller identification device for attachment to a partition to permit audio and visual access from one side to the other side thereof, comprising

(a) an outside unit for attachment at the outer side of said partition;

(b) an inside unit for attachment at the inner side of said partition;

(c) a viewing tube adapted to be secured to said partition in a position in which it extends from said one side to said other side thereof through an aperture therein;

(d) a switch on said inside unit, movable from its "on" position in which it projects from the surface of said inside unit, to its "off" position in which it is depressed toward said surface of said inside unit; and

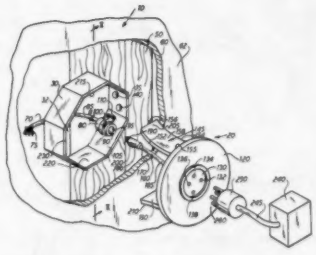
(e) a cover associated with said inside unit and movable from a first position in which it covers the inner end of said viewing tube and retains said switch in its "off" position, to a second position in which said inner end of said viewing tube is uncovered, releasing said switch to its "on" position;

(f) said outside and inside units each comprising an audio device comprising microphone means and speaker means, to facilitate audio-communication between individuals located on opposite sides of said partition.

4,273,957
TELECOMMUNICATIONS ACCESS APPARATUS

William J. Kolling, Jr., 3059 N. Olcott, Chicago, Ill. 60635

Filed Jun. 6, 1979, Ser. No. 45,996
Int. Cl.³ H04M *1/00*
U.S. Cl. 179—1 PC **19 Claims**



1. A modular communication access apparatus to attach a selected telecommunication device to a telecommunication line, having at least two conductors, which has been brought to a junction box mounted in a supporting wall, the apparatus comprising:

a first keyed socket having a plurality of socket terminations, of a first selected shape and size each operatively attached to one of the conductors in the telecommunications cable;

a mechanical support member having a body portion and an attachment portion, said body portion being capable of receiving and clamping said first keyed socket and said attachment portion being rigidly affixable to an interior region of the junction box mounted in the wall;

an attachment structure having;

a face plate; and, an outwardly oriented second keyed, socket, affixed to said face plate, said second keyed socket having a selected number of socket terminations of a selected size and shape different from said selected size and shape of said socket terminations of said first socket; and

a low power telecommunications wire of a selected length and a selected number of conductors, said selected number of conductors of said low-power telecommunications wire being operatively connected, at a first end, to said selected number of said socket terminations in said second keyed socket in said face plate; said selected number of conductors of said low-power telecommunications wire being connected, at a second end, to a selected set of plug

terminations in a keyed plug of a selected body size and shape; and

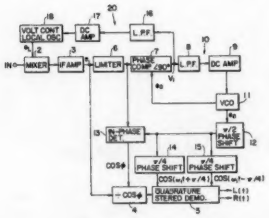
a face plate retaining means attached to said face plate and operative to removably affix said attachment structure to the junction box mounted in the wall;

said body of said keyed plug being removably insertable into said first keyed socket with said plug terminations conductively engaging said socket terminations of said first keyed socket so as to provide a selected number of electrical paths between the telecommunications cable within the junction box, said low-power telecommunications wire and said selected number of socket terminations in said outwardly oriented second socket in order that a selected telecommunications device may be plug-connected thereto and access the telecommunications line in the box.

4,273,958
QUADRATURE RECEIVER

Hitoshi Hirata, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Nov. 28, 1979, Ser. No. 98,284
Claims priority, application Japan, Dec. 1, 1978, 53-149482
Int. Cl.³ H04H *5/00*
U.S. Cl. 179—1 GS **6 Claims**



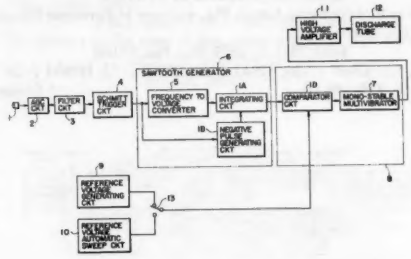
4. A quadrature stereophonic receiver circuit comprising: means for producing a local oscillation signal, means for mixing said local oscillation signal with a received signal to produce an intermediate frequency signal, a phase-locked loop circuit including means for comparing the phase of said intermediate frequency signal with an output signal of a voltage-controlled oscillator of said phase-locked loop, and means for controlling the frequency of said local oscillation signal in response to an output signal of said phase comparing means.

4,273,959
LARYNX STROBOSCOPE DEVICE

Koji Tuda, Tokyo; Hironobu Nagashima, and Masatoshi Marui, both of Kami Fukuoka, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 14, 1978, Ser. No. 960,544
Claims priority, application Japan, Nov. 14, 1977, 52-136434
Int. Cl.³ G10L *1/02*
U.S. Cl. 179—1 SC **14 Claims**

1. A larynx stroboscope comprising; saw tooth wave generating means for generating in synchronization with vocal cord vibrations at least one saw tooth wave; a reference voltage generating circuit having a variable output voltage; and a discharge tube light emission control signal generating circuit for generating a discharge tube light emission control signal in a phase shift range with respect to said vocal cord vibrations by comparing the instantaneous voltage of said saw tooth wave with the output of said reference voltage generating circuit, said discharge tube light emission control signal being generated in a desired phase of said vocal cord vibration over a

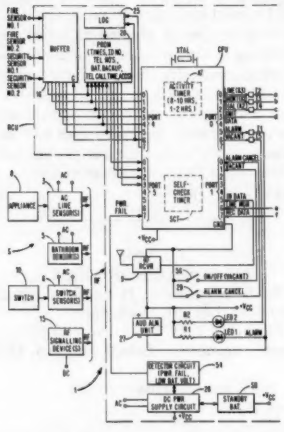


predetermined repetition rate period of said vocal cord vibrations.

4,273,960
APPARATUS FOR MONITORING USAGE OF A TELEPHONE

Robert J. Fahey, Framingham, and Martin L. Resnick, Chestnut Hill, both of Mass., assignors to GTE Products Corporation, Stamford, Conn. and GTE Laboratories Incorporated, Waltham, Mass.

Filed Nov. 14, 1979, Ser. No. 94,014
Int. Cl.³ H04M *11/04*
U.S. Cl. 179—5 R **10 Claims**



1. Apparatus for monitoring usage of a telephone, said telephone being connected across tip and ring terminals of a telephone system, said tip and ring terminals having a voltage thereacross of a value corresponding to the on/hook condition or off/hook condition of the telephone, said apparatus comprising:

status monitor circuit means operative to examine on a frequent basis the voltage across the tip and ring terminals and to produce an output having a first value when the voltage across the tip and ring terminals has a value corresponding to an on/hook condition and to produce an output having a second value when the voltage across the tip and ring terminals has a value corresponding to an off/hook condition;

activity timer means arranged to be set to a count of a predetermined first value;

count altering means operative to alter each count of the first

value to which the activity timer means has been set so as to have a predetermined second value at the expiration of a predetermined period of time;

alarm means operative when the count in the activity timer means has been altered to its second value to produce an alarm condition;

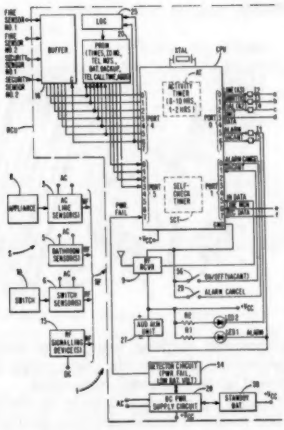
first means arranged to receive the outputs produced by the status monitor circuit means and to examine the values of said outputs to detect the occurrence of transitions in said outputs between the first and second values representing transitions between on/hook and off/hook conditions of the telephone, said first means being operative in response to detecting the occurrence of transitions in said outputs from the first value to the second value representing a transition of the telephone from its on/hook condition to its off/hook condition to produce a first output, and operative in response to detecting the occurrence of transitions in said outputs from the second value to the first value representing a transition of the telephone from its off-/hook condition to its on/hook condition to produce a second output; and

second means arranged to receive the first and second outputs produced by the first means and operative in response to each such output to cause the activity timer means to be set to the count of the first value, whereby if an output is produced by the first means during the predetermined period of time associated with the activity timer means the existing count of the activity timer means is replaced by the new count of the first value and the count altering means thereupon operates to alter the new count instead of the previous count.

4,273,961
APPARATUS FOR COMMUNICATING WITH PROCESSING APPARATUS OVER A TELEPHONE NETWORK

Hans G. Blank, and Martin L. Resnick, both of Chestnut Hill, Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Nov. 14, 1979, Ser. No. 94,017
Int. Cl.³ H04M *11/04*
U.S. Cl. 179—5 R **18 Claims**



1. In a signalling system, apparatus for communicating with processing apparatus over a telephone network, comprising:

first means operative under prescribed circumstances to produce an alarm condition for initiating an alarm communication over the telephone network;

second means operative at a prescribed time of day to produce a self-check condition for initiating a self-check communication over the telephone network;

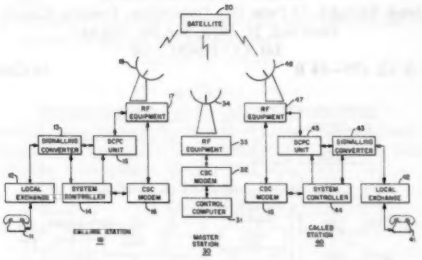
memory means arranged to store therein telephone number data representing a plurality of telephone numbers; and

third means operative following an alarm condition produced by the first means to obtain and employ selectively in a repeated sequential fashion the telephone number data stored in the memory means representing the plurality of telephone numbers, each up to a predetermined corresponding maximum number of times, in dialing operations for attempting a successful communication with the processing apparatus over the telephone network, and operative at or following a self-check condition produced by the second means and in the absence of an alarm condition produced by the first means to obtain and employ the telephone number data stored in the memory means representative of one, and only one, of the telephone numbers continuously for an indefinite number of times in dialing operations for attempting a successful communication with the processing apparatus over the telephone network, whereby the telephone number data stored in the memory means representative of the other telephone numbers is reserved exclusively for use in dialing operations following an alarm condition produced by the first means.

4,273,962
IMPULSE METERING OF LOCAL TELEPHONE SWITCHING OFFICES VIA A DAMA DOMSAT COMMUNICATION SYSTEM

William H. Wolfe, Satellite Beach, Fla., assignor to Harris Corporation, Cleveland, Ohio

Filed Aug. 29, 1978, Ser. No. 937,802
Int. Cl.² H04B *7/185;* H04M *15/12*
U.S. Cl. 179—7.1 R **19 Claims**



1. In a communication network wherein a communication link between relatively remotely located calling and called subscribers is established by a control facility separate and remote from respective calling and called stations to which said calling and called subscribers are coupled by way of associated local telephone exchanges, a system for supplying toll metering information to the local telephone exchange to which the calling subscriber is coupled comprising:

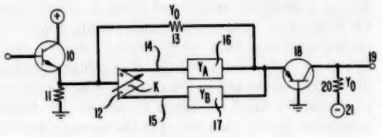
first means, located at said control facility, for storing data representative of the toll metering rate applicable to the call between said calling and called subscribers and for forwarding a message representative of said data to said calling station to which the local telephone exchange associated with said calling subscriber is coupled; and

second means, located at said calling station, and responsive to said message from said control facility, for generating metering impulse signals corresponding to said applicable toll metering rate and supplying said metering impulse signals to the local telephone exchange to which said calling subscriber is coupled.

4,273,963
AUTOMATIC EQUALIZATION FOR DIGITAL TRANSMISSION SYSTEMS

Harold Seidel, Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 25, 1979, Ser. No. 42,453
Int. Cl.³ H04B 3/14
U.S. Cl. 179—16 F 11 Claims



1. A broadband equalizer for telephone subscriber loops characterized by

a variable gain amplifier having a positive and a negative output,

a first resistive-capacitive network connected to said positive output,

a second resistive-capacitive network connected to said negative output,

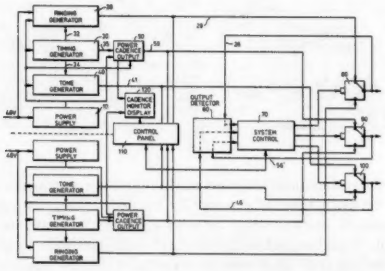
a resistance connected from the input of said amplifier to a common connection to said first and second networks, and

means responsive to signals on said telephone subscriber loops for varying the gain of said amplifier.

4,273,964
RING AND TONE PLANT

Motek Szpindel, 73 Palm Dr., Downsview, Toronto, Canada

Filed Sep. 21, 1978, Ser. No. 944,647
Int. Cl.³ H04M 1/26
U.S. Cl. 179—84 R 14 Claims



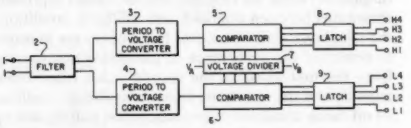
1. Telephone ringing current circuit comprising an AC supply and a D.C. supply, and a output line, first switching means responsive to a first control signal for connecting over a first connection said D.C. supply and said AC supply, in series, to said output line and responsive to a second control signal for the disconnection of said AC supply from said output line, second switching means, operable on said second control signal, for connecting over a second connection, said D.C. supply to said output line, said second switching means being controlled to open said second connection when said first connection is made,

wherein means are provided for completing said first connection responsive to said first control signal at approximately a zero crossing of said AC supply.

4,273,965
TONE DECODING CIRCUIT

Michael C. J. Cowpland, Ottawa, and Patrick R. Beirne, Stittsville, both of Canada, assignors to Mitel Corporation, Kanata, Canada

Filed Mar. 26, 1979, Ser. No. 23,999
Claims priority, application Canada, Oct. 6, 1978, 312903
Int. Cl.³ H04M 1/50
U.S. Cl. 179—84 VF 11 Claims



1. A tone decoder comprising:

(a) filter means for separating a group of high tone multifrequency signals and a group of low tone multifrequency signals,

(b) means for converting the period of the high tone and low tone signals to individual voltage levels relating to said periods, including means for generating first and second square wave signals in phase with each of the high tone and low tone signals respectively, first and second integrating means for integrating each of the corresponding square waves, means for sampling the integrated signal to form said voltage levels,

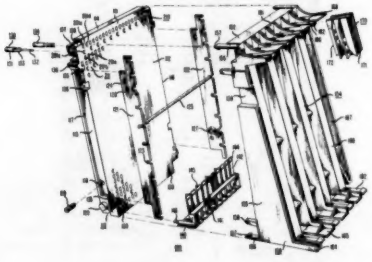
(c) means for comparing said voltage levels with a plurality of predetermined voltage ranges, and

(d) means for providing individual output signals upon coincidence of said voltage levels with related individual ones of the voltage ranges.

4,273,966
TERMINAL APPARATUS FOR TELECOMMUNICATIONS LINES

Paul R. Briggs, Jr., Andover, and Louis J. Scerbo, Succasunna, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 26, 1979, Ser. No. 79,063
Int. Cl.³ H04Q 1/14
U.S. Cl. 179—98 18 Claims



1. A prefabricated modular main frame interconnection panel for interconnecting outside plant wires with central office equipment leads, said panel comprising

means for receiving protector devices on one face of said panel, said receiving means including electrical terminals accessible through the opposite face of said panel,

connector means for terminating said wires,

jumper means for joining said connector means to a first grouping of said terminals, said equipment leads terminating on a second grouping of said terminals, and

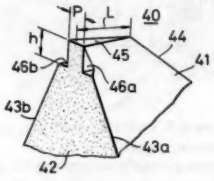
means for rotatably snap-mounting said panel into said main frame.

4,273,967

STYLUS FOR REPRODUCING CAPACITIVE VIDEODISC

Yoshiyo Wada; Kunio Goto, and Hisao Kinjo, all of Yokohama, Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Continuation of Ser. No. 852,366, Nov. 16, 1977, Pat. No. 4,199,782. This application Apr. 18, 1979, Ser. No. 31,035
Claims priority, application Japan, Nov. 17, 1976, 51-137216; Feb. 25, 1977, 52-20065; Mar. 28, 1977, 52-34106
The portion of the term of this patent subsequent to Apr. 22, 1997, has been disclaimed.
Int. Cl.³ H04N 5/80
U.S. Cl. 369—126 4 Claims



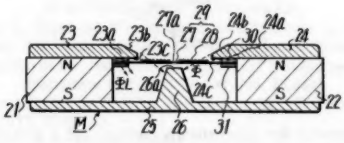
4. A reproducing stylus for tracing a track of a recording medium in which track an information signal is recorded as variations of geometrical shape, and for reproducing as variations in capacitance the information signal thus recorded, said stylus having multiple facets comprising a tip of the stylus, one of the facets being disposed with an electrode which contacts at one end thereof a surface of the recording medium to reproduce the information signal, other two ends of the electrode being substantially parallel to each other so that the width of the electrode is maintained substantially constant at said one end despite wear of the tip, another of said facets being for slidingly contacting the surface of the medium and increasing its contacting area by enlarging its length in the direction of tracking as the wear progresses.

4,273,968

ELECTROACOUSTIC TRANSDUCER WITH MAGNETIC FLUX DIRECTED SLANTLY ACROSS A DIAPHRAGM

Hideo Suyama, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 17, 1979, Ser. No. 39,909
Claims priority, application Japan, May 22, 1978, 53/60842
Int. Cl.³ H04R 7/26, 9/02
U.S. Cl. 179—115.5 PV 6 Claims



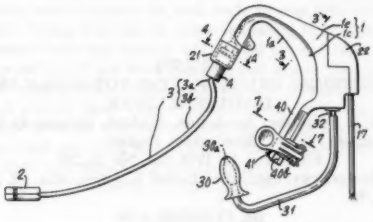
1. An electroacoustic transducer comprising:
(a) a magnetic circuit consisting of a pair of permanent magnets parallely positioned with respect to each other;
(b) a yoke magnetically coupled to said pair of magnets and having a center pole and a pair of plates magnetically coupled to said magnets, said center pole being postioned equidistant from said plates;
(c) a pair of air gaps formed by said center pole and each of said plates; and
(d) a diaphragm having a conductor disposed in said air gaps, wherein said plates position above one side surface of said diaphragm and said center pole positions under the other side surface of said diaphragm, whereby magnetic flux flows through said air gaps so as to be slantly across the conductor of said diaphragm.

4,273,969

COMMUNICATIONS HEADSET MOUNTABLE OVER THE EAR

James P. Foley, Astoria; Bernard F. Klock, Brooklyn, and Michael D'Agostino, Staten Island, all of N.Y., assignors to Roanwell Corporation, New York, N.Y.

Filed Jun. 1, 1979, Ser. No. 44,572
Int. Cl.³ H04M 1/05
U.S. Cl. 179—156 A 17 Claims



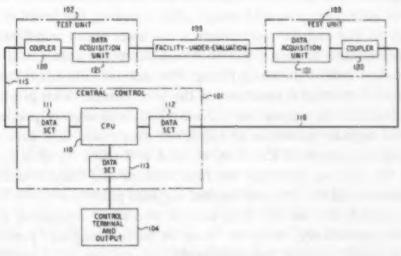
1. A communications headset including:
a. a capsule adapted to fit over the ear of a wearer, said capsule having a transversely rounded inner surface adapted to contact the periphery of the auricle of the wearer's ear, tangential surfaces diverging from the rounded surface to form a tapering portion of the capsule whose thickness increases in the direction away from the ear, and a peripheral portion of the capsule having lateral surfaces adjoining the tangential surfaces at the thicker end of the tapering portion;
b. microphone means supported on one end of the capsule; and
c. acoustic tube means communicating with the capsule and adapted to engage the wearer's ear.

4,273,970

INTERMODULATION DISTORTION TEST

David L. Favin; Peter F. Lynn, both of Little Silver, and Paul J. Snyder, Linden, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 28, 1979, Ser. No. 107,788
Int. Cl.³ H04M 3/26
U.S. Cl. 179—175.3 R 10 Claims



1. Apparatus (FIG. 1) for obtaining a measure of nonlinear distortion of a communications facility (105) of the type including means for obtaining measurements of second order intermodulation distortion products and third order intermodulation products by transmitting test signals on the facility (105), CHARACTERIZED BY,
means (FIG. 2, 220, 222, 208, 209, etc.) for generating a first

test signal (3-tone) to be applied to the communication facility (105) including first (A), second (B) and third (B+3Δ), tones, having predetermined amplitudes, a prescribed one of said tones having an amplitude in predetermined relationship to, and different from, the amplitudes of remaining ones of said tones, to obtain a test signal having a prescribed amplitude density function.

4,273,971

ELECTRICAL SWITCH HAVING ROTATABLE AND PIVOTABLE LEVER

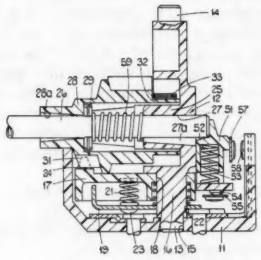
Steven J. Tregurtha, Accrington, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Mar. 23, 1979, Ser. No. 23,278

Claims priority, application United Kingdom, Mar. 28, 1978, 11969/78

Int. Cl.³ H01H *9/00*

U.S. Cl. 200—4 **9 Claims**



1. An electrical switch including a body, a rotor mounted in the body for rotation relative thereto about a first axis, a movable electrical contact movable with the rotor, first, second and third fixed electrical contacts supported by the body and engageable slidably by the moving contact in its movement about said first axis, an operating lever extending from the body transverse to said first axis, means coupling said operating lever to said rotor whereby rotation of said lever about its longitudinal axis is transmitted to said rotor to move the rotor about said first axis, said means also coupling the lever to the rotor so that angular movement of the lever about said first axis is transmitted to said rotor to move the rotor about said first axis, first detent means defining first, second and third predetermined rotational positions of the lever about its longitudinal axis, second detent means defining first and second predetermined angular positions of the lever about said first axis, and the arrangement of the first, second and third fixed contacts and the spacing between the first, second and third rotational positions and the first and second angular positions of the lever being such that in the first, second and third rotational positions respectively, with the lever in its first angular position, the movable contact is respectively, clear of the fixed contacts, in engagement with the first fixed contact, and in engagement with the first and second fixed contacts, whereas in the first, second and third rotational positions respectively, with the lever in its second angular position, the movable contact is respectively, clear of the fixed contacts, in engagement with the first and second fixed contacts, and in engagement with the first and third fixed contacts.

4,273,972

JOYSTICK CONTROL ELECTRIC SWITCH

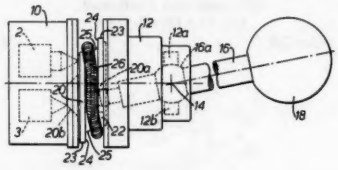
Edmund M. Butterworth, Bedford, England, assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 20, 1979, Ser. No. 105,665

Claims priority, application United Kingdom, Jan. 3, 1979, 141/79

Int. Cl.³ H01H *25/00*

U.S. Cl. 200—6 A **4 Claims**



1. An electric switch joystick controller, comprising:

(a) a joystick having opposite ends;

(b) pivoting means pivotally supporting the joystick intermediate its end so as to be manually movable from one of its ends about the pivot;

(c) electric switch means adjacent the other end of the joystick and having respective actuators cooperating with said other end of the joystick in predetermined pivotal positions of the joystick;

(d) a pair of axially aligned ring members, one ring member being fixed relative to said pivoting means and the other ring member being slidable radially relative to the fixed ring member upon pivoting of the joystick; and

(e) a resilient band encircling the two ring members and providing a bias on the joystick, tending to return it to a neutral position.

4,273,973

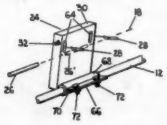
AUTOMATIC ELECTRIC DOWNRIGGER SHUT-OFF SWITCH

Roger C. Bruins, 1503 Broadview, Jenison, Mich. 49428, and Earl D. Hart, 2621 Thornapple River Dr., SE., Grand Rapids, Mich. 49508

Filed Dec. 17, 1979, Ser. No. 104,431

Int. Cl.³ H01H *15/14*; B65H *17/52*

U.S. Cl. 200—47 **11 Claims**



1. Apparatus for automatically shutting off a downrigger having an electric motor-operated reel, a power source electrically connected to the motor, and an electrically conductive downrigger cable extending outwardly from the reel, the apparatus comprising:

a pair of separated electrical contacts;

means for mounting the electrical contacts in a predetermined position on the downrigger, such that the contacts are in continuous physical contact with the cable as it extends from the reel, the cable forming a conductive path between the contacts;

means connected to the electrical contacts and the electrical connections for the electric motor for disconnecting the power source from the electric motor when said conductive path between the contacts is broken; and

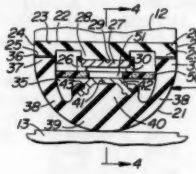
means mounted on the cable for breaking the conductive path between the contacts when the cable reaches the predetermined position as it is reeled in by the motor.

4,273,974

ELONGATE SWITCH CONSTRUCTION

Norman K. Miller, Concord Industrial Park, Concordville, Pa. 19331

Filed Mar. 12, 1979, Ser. No. 19,428
Int. Cl.³ H01H *3/16*
U.S. Cl. 200—61.43 **4 Claims**



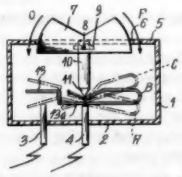
1. A switch construction comprising an elongate base, an elongate resiliently flexible working member extending longitudinally of and in facing relation with said base, said working member being transversely concave toward said base and combining therewith to define a longitudinally extending internal hollow, an elongate base contact disposed longitudinally within said hollow and carried by said base facing toward said working member, a flexible tongue on said working member extending internally of said hollow toward and terminating short of said base contact, and an elongate tongue contact carried by said tongue in facing spaced relation and displaceable into engagement with said base contact upon flexure of said working member, said working member being of arcuate generally constant cross-section and comprising a pair of relatively thick longitudinal edge portions secured to said base and tapering in the direction away from said base to a pair of relatively thin longitudinally extending intermediate portions, said tongue being defined by a relatively thick longitudinally extending medial portion of said working member between said intermediate portions and isolated from said edge portions for relatively free movement of the tongue and tongue contact generally toward said base upon application of external force, by the initial flexing tendency of said relatively thin intermediate portions and the relative resistance to flexing of the edge portions.

4,273,975

ELECTRIC CIRCUIT BREAKER

Philippe L. Vandame, Versailles, France, assignor to Nordic Finance and Trade (Panama) Ltd. Inc., Panama, Panama

Continuation of Ser. No. 760,510, Jan. 19, 1977, abandoned. This application Apr. 9, 1979, Ser. No. 28,202
Claims priority, application France, Jan. 20, 1976, 76 01443; Jan. 6, 1977, 77 00282
Int. Cl.³ H01H *1/18, 5/22*
U.S. Cl. 200—67 C **7 Claims**



1. An electric switch comprising:

a casing with a bottom;

a rocking lever pivotally mounted in the casing, said rocking lever having at least one tapered end;

at least two terminals fixedly mounted in the bottom of said casing; and

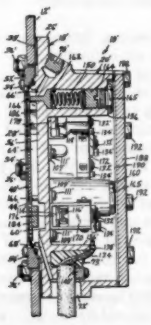
a blade of resilient material, formed as a single piece, having an upper and a lower portion, said upper portion of said blade having a shaped free end and said lower portion of said blade having a flat part, said flat part being slidingly mounted on at least one of said terminals, the said shaped free end of said blade being located essentially above the central region of the said lower portion such that, as the blade slides and swivels, the resilient material provides a spring action causing the said blade to snap into contact after sliding over center, while remaining at all times in contact with said tapered end of said pivoted lever; the tapered end of said lever engaging said shaped free end of the upper portion of said blade whereby actuation of the said pivoted lever causes the lower portion of the said blade to rotate about and to slide on at least one of said terminals and bring said lower portion of said blade into contact with another of said terminals.

4,273,976

PRESSURE RESPONSIVE SWITCH DEVICE

Byron F. Wolford, Fergus Falls; John F. Rose, Underwood, and James Thunselle, Fergus Falls, all of Minn., assignors to Proximity Controls, Inc., Fergus Falls, Minn.

Filed Jun. 6, 1979, Ser. No. 45,926
Int. Cl.³ H01H *35/34*
U.S. Cl. 200—83 L **32 Claims**



1. A switch device for monitoring a fluid pressure source comprising:

a housing;

a plurality of switches supported within said housing;

a movable member supported external of said housing and movable in response to fluid pressure, said member having a first face adapted to face a fluid pressure source and a second face facing an external wall of said housing;

a plurality of first magnets connected to said member at different locations thereon;

a plurality of second magnets supported within said housing, each of said second magnets being connected to one of said switches for activation of a respective switch, and each of said second magnets being disposed adjacent one of said first magnets whereby motion of one of the first magnets causes one of said second magnets to move and activate one of said switches connected thereto; and

a plurality of discrete first biasing means for biasing said member away from said wall of said housing, each first biasing means providing a biasing force at a different location on said member, and at least two of said first biasing means having different biasing forces for biasing

different portions of said member away from said housing with different forces;

a plurality of second adjustable biasing means supported within said housing and biasing said second magnets to oppose the activation movement of said first magnets.

4,273,977

CIRCUIT INTERRUPTER

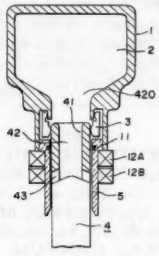
Masami Kii, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 14, 1978, Ser. No. 933,532

Claims priority, application Japan, Aug. 31, 1977, 52-105165; Aug. 31, 1977, 52-105166; Aug. 31, 1977, 52-105167; Aug. 31, 1977, 52-105168

Int. Cl.³ H01H *9/44, 33/18*

U.S. Cl. 200—147 R **7 Claims**



1. A circuit interrupter comprising:

a housing;

a chamber in said housing forming a volumetric space for storing a fluid for arc extinction;

a fixed contact in said housing;

a movable contact in said housing, said movable contact initially contacting said fixed contact;

means for moving said movable contact to form an arc;

an arc space in said housing for said arc, said arc space being connected to said chamber by a first passage;

a second passage in said housing for discharging fluid from said chamber out of said housing via said arc chamber; and

means for forming in said arc space a magnetic field, transverse to the direction of movement of said movable electrode, said means for forming comprising an arcing electrode in said arc space and at least two coils surrounding said arc space on said housing and connected between said arcing electrode and said fixed electrode, said at least two coils forming at least two transverse magnetic fields of opposite polarity, whereby said arc is extinguished.

4,273,978

LIQUID INTERRUPTER MODULE

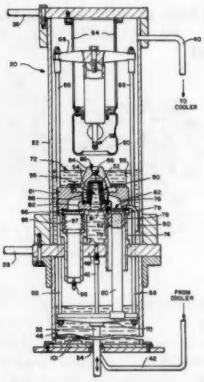
Joseph R. Rostron, Murrysville, Pa., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jun. 9, 1978, Ser. No. 914,026

Int. Cl.³ H01H *33/82*

U.S. Cl. 200—148 R **14 Claims**

1. A current interrupter comprising: an enclosure, a fixed contact in said enclosure, a movable contact in said enclosure, said movable contact being movable into electrical contact with said fixed contact, a dielectric located within said enclosure wherein the temperature and pressure conditions are such that said dielectric exists in a gaseous form in the upper part of said enclosure and in a liquid form in the lower part of said enclosure, a boundary being defined between the gaseous form and liquid form of said dielectric, a cylinder positioned in the lower part of said enclosure to be below the boundary defined by the gaseous form and liquid form of said dielectric, a pump piston supported movement in said cylinder, a flow passageway extending from an opening of said cylinder to said fixed contact to establish fluid communication therebetween for the flow of the liquid form of said dielectric into the vicinity of said fixed contact, a first check valve in said flow passageway for permitting unidirectional flow from said cylinder to said fixed contact, a refill passage in said enclosure for establishing fluid communication between said cylinder and the liquid form of said dielectric for refilling said cylinder with the dielectric



liquid, and means for moving said pump piston and said movable contact to separate and reclose said contacts and to drive said pump piston in said cylinder, said pump piston forcing the liquid form of said dielectric through said flow passageway upon contact separation and drawing the liquid form of said dielectric into said cylinder by way of said refill passage upon contact reclosure.

4,273,979

LOW-VOLTAGE CIRCUIT BREAKER WITH MEANS FOR LIMITING CONTACT LIFTING

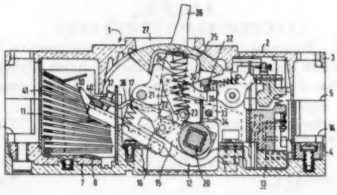
Klaus-Günther Berndt; Manfred Krüger, and Wolfgang Nawrot, all of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 11, 1979, Ser. No. 29,025

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1978, 2817668

Int. Cl.³ H01H *3/60*

U.S. Cl. 200—286 **1 Claim**



1. A low voltage circuit breaker comprising:

a fixed contact;

a movable, pivoted contact carrier;

a movable contact, pivoted around a joint on the contact carrier and having a contact overlay;

a pressure spring between the movable contact carrier and the movable contact and tending to move the movable contact around the joint;

an arm extending from the contact carrier approximately to the contact-making end of the movable contact; and

an adjustable stop for limiting lifting of the movable contact

from the "on" position, the adjustable stop positioned on the arm to act centrally of the contact overlay;

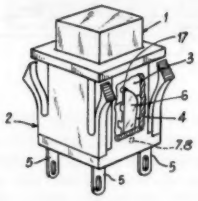
the contact spring located next to the stop between the stop and the joint.

4,273,980

SPRING-LOADED CATCH MECHANISM FOR PUSH-BUTTONS OF ELECTRICAL APPARATUS

Jean Rogero, Rue de l'Industrie, 82270 Montpezat de Quercy, France

Filed Oct. 24, 1979, Ser. No. 88,074
Claims priority, application France, Oct. 26, 1978, 78 30436
Int. Cl.³ H01H 3/14, 13/56
U.S. Cl. 200—328 6 Claims



1. A spring-loaded catch mechanism for a push-button of an electrical apparatus, said push-button being slidably guided in a housing relatively to which it is urged outwardly by a return spring, which catch mechanism includes a catching lever of plastic material pivotally mounted on said housing through a pivot and including a depressed area which is limited at least partly at its outer periphery through projecting ramps and near the center of which projects an integral stud member bounded by a notch and by further ramps,

said push-button being provided with a pin accommodated in the depressed area of said catching lever and said ramps being shaped and arranged so that, when push-button is depressed from a rest position and then released, said ramps reciprocate the catching lever about its pivot and thus constrain the pin to by-pass the stud member along one side thereof and then to lie under said stud member, after which said return spring urges the pin into the notch and holds it therein in a working position, whereas, when the push-button is depressed from this working position and then released, said ramps reciprocate the catching lever about its pivot and thus constrain the pin to by-pass the stud member along the opposite side thereof and then to lie above said stud member, after which said return spring urges the push-button to and holds it in its rest position, and so on,

braking means being provided for braking the movements of the catching lever,

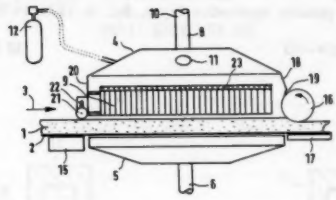
wherein the catching lever is made integral with its pivot which is accommodated in a hole provided in a wall of the housing as well as with the braking means, said catching lever including as said braking means a relatively thin, resiliently deformable finger portion which at rest projects locally relatively to the whole of the catching lever from the same side as the pivot and thus presses on that housing wall provided with said hole with a pressure sufficient to prevent the catching lever from rotating in the absence of any forces exerted through engagement of the pin with said ramps.

4,273,981

APPARATUS FOR HEATING A FLEECE

Herbert Nopper, Kuppenheim, Fed. Rep. of Germany, assignor to Casimir Kast GmbH & Co. K.G., Gernsbach, Fed. Rep. of Germany

Filed Oct. 17, 1979, Ser. No. 85,762
Int. Cl.³ H05B 5/08
U.S. Cl. 219—10.49 R 14 Claims



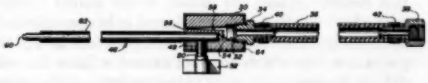
1. A device for heating a fleece, comprising a heating station having two chambers arranged so as to be opposite to each other with respect to a fleece passing therebetween, a moving perforated fleece carrier on which said fleece is disposed, a fan connected to said chambers to maintain one of said chambers at a higher pressure than the other of said chambers, said fan being connected to the high pressure one of said chambers by a pressure conduit and to the low pressure one of said chambers by a suction conduit so as to form a closed circuit, and a heating radiator having heating elements therein learning clear between themselves flow channels for a gas heating and flowing through the fleece.

4,273,982

UNDERWATER CUTTING AND GOUGING METHOD

Myron D. Stepath, Lancaster, Ohio, assignor to Arcair Company, Lancaster, Ohio

Filed May 19, 1976, Ser. No. 687,939
Int. Cl.³ B23K 9/00, 35/10
U.S. Cl. 219—70 12 Claims



1. A method of removing metal from an object submerged in a liquid medium comprising the steps of:

establishing an electric arc between an elongated solid electrode and the workpiece thus heating and melting that portion of the object under the arc; and

removing the molten metal from the portion of the object being heated by and beneath the arc by directing, from a location spaced from said electrode at least one stream of high pressure liquid to pass between the electrode and the object being heated to impinge upon and carry the molten metal away from the object.

4,273,983

METHOD OF RESISTANCE WELDING

Masahiro Ogawa, Toyoake, and Tugio Mizobe, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation-in-part of Ser. No. 850,192, Nov. 10, 1977, abandoned, which is a continuation of Ser. No. 715,876, Aug. 19, 1976, abandoned, which is a continuation-in-part of Ser. No. 486,872, Jul. 9, 1974, abandoned. This application Jul. 17, 1979, Ser. No. 58,172

Claims priority, application Japan, Jul. 14, 1973, 48-78909

Int. Cl.[3] B23K *11/20*

U.S. Cl. 219—93 30 Claims

1. A method for resistance welding two members made of dissimilar metals that includes the steps of placing a surface of a first member made of one metallic material into electrically conductive contact with a surface of a second member made of another metallic material different from the first material, passing an electrical welding current across the contact area between the two members for a time sufficient to render plastic a portion of the metallic material of one of the members, and pressing the first and second members together with sufficient force to squeeze any surface impurities and intermetallic compounds to the edges of the contact area, wherein the improvement comprises:

forming at least one small, integral, tapered, flattopped projection of trapezoidal cross section on the first member, the projection having a predetermined height, divided into a top portion, an intermediate portion and a base portion, and a predetermined width of the flat-topped surface, and opposite sides of the tapered projection each making a predetermined angle with a line perpendicular to the flat-topped surface such that passage of a welding current through the projection will generate a temperature distribution that decreases continuously from the top portion to the base portion, and further, that the projection radially spreads in a plastic flow;

pressing the top surface of the at least one projection of the first member against the surface of the second member with a high welding pressure selected to be approximately in the range of 15–100 kg/mm^2 of top surface area of the projection, but which does not exceed a force that will deform the projection prior to the application of welding current, and;

passing a predetermined high welding current density approximately in the range of 0.75 to 3.4 KA/mm^2 to top surface area of the projection for a short time period approximately in the range of 0.5 to 10 cycles at 60 Hz, such that the contacting surfaces of the two members are melted, said intermediate portion of the projection flows plastically under said welding pressure and the base portion of the projection does not plastically flow, and due to said plastic flow, obtaining welded surfaces having no intermetallic compound of said dissimilar metals remaining at said welded surfaces.

4,273,984

FLASH BUTT WELDING APPARATUS

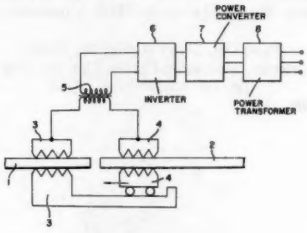
Katsunori Hara; Toshihiko Baba, and Takio Okuda, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Amagasaki, Japan

Continuation of Ser. No. 763,116, Jan. 27, 1977, abandoned. This application Sep. 22, 1978, Ser. No. 945,009

Claims priority, application Japan, Feb. 6, 1976, 51-11886

Int. Cl.[3] B23K *11/04*

U.S. Cl. 219—97 5 Claims



1. A flash butt welding apparatus for welding the opposing ends of two workpieces together which comprises:

DC power source means for supplying a DC output voltage;

inverter means coupled to said DC power source means for converting the DC output voltage of said DC power source means to a rectangular waveform AC voltage;

first electrode means for electrically contacting one of said work pieces and movable therewith;

second electrode means for electrically contacting the other of said workpieces, said second electrode means being stationary;

a welding transformer having at least one primary winding and at least one secondary winding, the primary winding of said transformer being connected to the output of said inverter means and the secondary winding of said transformer being connected between said first electrode means and said second electrode means such that the rectangular waveform AC voltage output of said welding transformer appears between said first and said second electrode means;

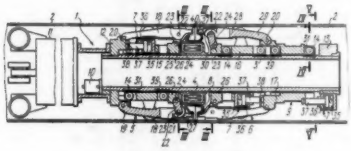
means for gradually and continually moving said first electrode means and the workpiece contacted by said first electrode means toward said second electrode means and said other workpiece contacted by said second electrode means to cause a series of successive partial contacts between portions of the opposing ends of said two workpieces such that an AC current from said transformer flows through each area of partial contact, said AC current operating to successively melt each area of partial contact and to successively scatter each of said melted areas as flash, said flash scattering forming gaps in the opposing ends of said workpieces resulting in the formation of electric arcs between said workpieces, and for rapidly pushing said workpieces together to complete the butt weld when the temperature of the opposing ends of said workpieces has been raised sufficiently by said successive melting and flashing, the direction of motion of said workpieces under control of said moving means being constant throughout the flash butt welding operation.

4,273,985

INTERNAL RESISTANCE PIPE BUTT WELDER

Boris E. Paton, ulitsa Chkalova, 41a, kv. 26, Kiev; Boris E. Scherbina, Kholzunov pereulok, 10, kv. 35, Moscow; Vladimir K. Lebedev, ulitsa Engelsa, 25, kv. 12, Kiev; Oleg M. Ivantsov, Aptekarsky pereulok, 98/2, kv. 23, Moscow; Sergei I. Kuchuk-Yatsenko, ulitsa Filatova, 1/22, kv. 47, Kiev; Vasily A. Sakharnov, ulitsa Solomenskaya, 41, kv. 93, Kiev; Boris A. Galian, ulitsa Lenina, 88/92, kv. 110, Kiev; Mikhail R. Unigovsky, ulitsa Pushkinskaya, 21, kv. 33, Kiev, and Orest M. Serafin, ulitsa Dirizhabelnaya, 28, korpus 1, kv. 45, Dolgoprudny, all of U.S.S.R.

Filed May 4, 1979, Ser. No. 36,166
Claims priority, application U.S.S.R., May 4, 1978, 2625038
Int. Cl.[3] B23K *11/04, 37/04*
U.S. Cl. 219—101 14 Claims



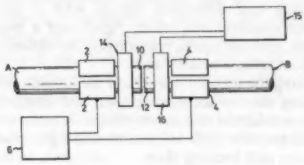
1. A resistance butt welder adapted to be accommodated inside pipes to be welded for aligning a new pipe relative to a pipeline and forming a weld joint, comprising: a housing having a longitudinal axis matched with the axis of pipes to be welded; an annular welding transformer with first and second poles, mounted on said housing coaxially therewith and disposed inside said pipes and lying beneath the weld joint to be formed; a first pipe clamping mechanism and a second pipe clamping mechanism, both mounted on said housing and electrically connected to said welding transformer; a pipe flashing and upsetting mechanism mounted on said housing and kinematically coupled to one of said pipe clamping mechanisms; two hydraulic drives, each intended to move the respective pipe clamping mechanism along the axis of said housing; a hydraulic drive for moving said pipe flashing and upsetting mechanism along the axis of said housing; a hydraulic pump mounted on said housing and adapted to supply working fluid to said hydraulic drives of said first and second pipe clamping mechanisms and said pipe flashing and upsetting mechanism; a mechanism to drive the welder along the axis of pipes to be welded, mounted on said housing; first and second bearing discs rigidly mounted at the opposite ends of said housing; three clips having end faces and being mounted on said housing so as to be movable along the axis of said hosing, two of said clips are incorporated in said first and second pipe clamping mechanisms, respectively, whereas the third clip is incorporated in the pipe flashing and upsetting mechanism; said clip of said first pipe clamping mechanism being interposed between the welding transformer and the first bearing disc and is coupled to said first bearing disc by means of said hydraulic drive of said first pipe clamping mechanism; said clip of said pipe flashing and upsetting mechanism being arranged close to the second bearing disc and is coupled thereto by means of said hydraulic drive of said pipe flashing and upsetting mechanism; said clip of said second pipe clamping mechanism being interposed between said clip of said first pipe clamping mechanism and said clip of said pipe flashing and upsetting mechanism and is coupled to sid clip of said pipe flashing and upsetting mechanism by means of said hydraulic drive of said second pipe clamping mechanism; a kinematic coupling is disposed between said clip of said first pipe clamping mechanism and the first bearing disc; and a kinematic coupling is disposed between said clip of said second pipe clamping mechanism and said clip of said pipe flashing and upsetting mechanism.

4,273,986

METHOD AND APPARATUS FOR ARC BUTT WELDING

Donald Edson, Newton, and Albert W. Carter, Stapleford, both of England, assignors to Blacks Equipment Limited, Bromley, England

Filed Nov. 15, 1979, Ser. No. 94,754
Claims priority, application United Kingdom, Nov. 15, 1978, 44654/78
Int. Cl.[3] B23K *9/08*
U.S. Cl. 219—123 14 Claims



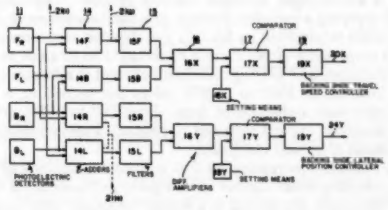
1. A method of joining two parts by an arc butt welding process, comprising the steps of striking an arc between the two faces to be joined, moving the arc over the faces by means of a magnetic field, relatively moving the two faces in a plane generally parallel to the faces such that the overlapping area of the two faces changes during the arc-heating period, so that the magnetic field and the relative movement constrain the arc roots to move over substantially the whole of each face, and then bringing the faces into registration and applying forging pressure across the said faces.

4,273,987

METHOD OF CONTROLLING SYNCHRONIZED MOVEMENT OF BACKING SHOE IN AUTOMATIC ONE-SIDE WELDING

Hirokazu Nomura; Yukihiko Sato, both of Tsu, and Yoshikazu Sato, Mie, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 12, 1979, Ser. No. 75,204
Claims priority, application Japan, Sep. 19, 1978, 53-114070
Int. Cl.[3] B23K *9/12*
U.S. Cl. 219—124.34 1 Claim



1. In an automatic one-side welding process of the type wherein a light-transmittable backing material is placed in contact with a back surface of a welding joint of base metals, and a backing shoe movable in synchronism with movement of a welding apparatus is held in contact with the back surface of said welding joint just below an electrode through said backing material to thereby effect the welding of said base metals, a method of controlling the synchronized movement of said backing shoe in one-side welding, said method comprising the steps of:

producing an electric signal by each of four photoelectric detecting means adapted to receive light from the back surface of said welding joint through said backing material to produce electric signals corresponding to the amount of light received thereby, said photoelectric detecting means being embedded in the surface of said backing shoe placed

in contact with said backing material at four positions of right-front, right-back, left-front and left-back relative to just below said electrode with respect to a direction of welding, said positions being arranged with predetermined longitudinal and lateral spaces therebetween;

adding said signals corresponding to said front positions, said back positions, said right positions and said left positions, respectively, to obtain front and back sum signals and right and left sum signals;

producing difference signals corresponding to the difference between said front and back sum signals and the difference between said right and left sum signals, respectively;

comparing said difference signals with a predetermined proper synchronized travel signal and a predetermined proper position signal, respectively, to obtain corresponding comparison results; and

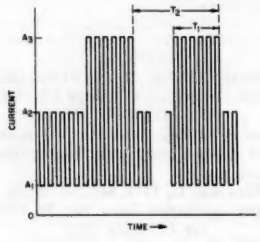
controlling the speed of travel and the lateral position of said backing shoe in accordance with said comparison results so as to maintain said below-electrode-point at a predetermined position with respect to said light receiving positions on said backing shoe.

4,273,988

PULSE WELDING PROCESS

William F. Iceland, Los Alamitos, and Donald P. Viri, Simi Valley, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 23, 1979, Ser. No. 69,028
Int. Cl.³ B23K *9/09*
U.S. Cl. 219—137 PS **11 Claims**



1. A gas-shielded metal-arc welding process comprising:

(a) applying a sufficient voltage to a consumable metal electrode to establish an arc in a gas shielded environment;

(b) supplying a direct current of about 15 to 80 amps to said electrode and pulsing said direct current at a frequency of from about 5000 to 25,000 pulses per second to a first maximum amplitude of from about 100 to 125% of the minimum current required to produce a spray transfer of metal from said electrode;

(c) cyclically increasing the first maximum amplitude of said pulsating direct current at a frequency of from about 90 to 400 cycles per second to a second maximum amplitude of from about 150 to 600% of the minimum current required for spray transfer of metal and maintaining said second amplitude for a time of from about 5 to 50% of each cycle.

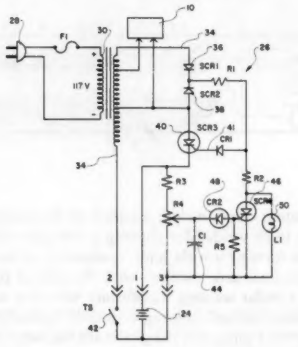
4,273,989

BATTERY POWERED THERMAL GARMENT WITH FAST AND EFFICENT RECHARGING CIRCUIT

David O. Hinton, 4700 Hiddenbrook Dr., Raleigh, N.C. 27609, and Jean G. French, 1045 Huntingdon Ct., Stone Mountain, Ga. 30083

Filed Jun. 30, 1980, Ser. No. 164,825
Int. Cl.³ H05B *1/02*
U.S. Cl. 219—211 **4 Claims**

1. A battery powered thermal garment and battery recharging circuit comprising: a thermal garment designed to be worn about the body of an individual and provided with heating element means disposed therein; and a power package for directing current to said thermal garment and powering the same including a battery package and a recharging circuit for recharging said battery package; said battery package being adapted to connect to said thermal garment and to selectively energize said heating element means therein; said recharging circuit being adapted to connect to said battery package for recharging the same and including means for connecting to an AC voltage source and directing the resulting AC voltage to said recharging circuit; transformer means for receiving said AC voltage and reducing the AC voltage to a selected secondary voltage; first tap means operatively associated with said transformer means and directed therefrom for directing a first current from said transformer means that can be directly coupled to said thermal garment for powering the same independently of said battery package; second tap means operatively



associated with said transformer means and directed therefrom for generating a second recharging current within said recharging circuit; rectifying means for receiving said second recharging current and rectifying the same; switch means disposed within said recharging circuit and further operatively connected to said battery package for directing the recharging rectified current thereto for charging the same; means disposed within said recharging circuit for sensing the charge on said battery package and effectively controlling the flow of current through said switch means to said battery package in response to said battery package having a certain charge level; and thermal switch means operatively associated with said battery package for sensing the temperature of said battery package and terminating the flow of recharging current thereto in response to the temperature of said battery package being equal to or above a selected temperature.

4,273,990

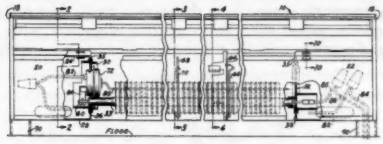
BASEBOARD HEATER WITH HIGH TEMPERATURE CUT-OFF SWITCH

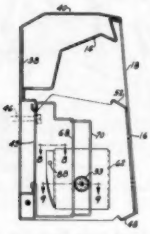
Robert E. Steiner, Columbus, Ind., and Thomas J. Long, Florence, S.C., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Dec. 14, 1979, Ser. No. 103,605
Int. Cl.³ H05B *1/02*
U.S. Cl. 219—363 **2 Claims**

1. A baseboard heater comprising an elongated casing mounted horizontally against a wall of a room and spaced from the floor, the bottom and upper front side of said casing being open so as to permit the free vertically upward and then forward flow of air therethrough, said casing including a rear sidewall lying against the room wall and a partial front sidewall enclosing the lower front side of said casing, an elongated electrical resistance heating element positioned in the lower portion of said casing adjacent the open bottom thereof and extending longitudinally between said casing sidewalls, a high temperature cut-off switch controlling the flow of energy to said heating element, actuating means for said switch including

a capillary tube containing a thermally expansible fluid which when heated sufficiently effects actuation of said switch, said heating element is equipped with a plurality of longitudinally, radially extending fins fixed thereon, and in which said capillary tube extends between a sidewall of said casing and the adjacent peripheries of said fins, and is connected to said adjacent peripheries of at least some of said fins so as to lie in and be cooled by the upward flow of substantially unheated air entering said open casing bottom.



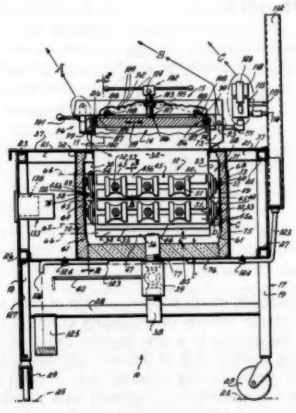


4,273,991

PRESSURE COOKER

Donald R. Barnhill, Hamilton, Ohio, assignor to B & W Metals Company, Inc., Fairfield, Ohio

Filed Nov. 29, 1979, Ser. No. 98,673
Int. Cl.³ F27D *11/02*
U.S. Cl. 219—440 **3 Claims**



1. A pressure cooker comprising

a tank positioned within a housing, said tank having plural walls and a floor, the floor of said tank sloping downwardly toward the center thereof from the bottom edges of at least two of said walls,

a cover receivable in sealing relation with the top of said tank,

a plurality of generally linear strip electrical resistance heater elements mounted to said plural walls on the exterior surfaces thereof, said strip heater elements being spaced one from the other and being disposed generally parallel one to the other, said heater elements being disposed generally parallel to the bottom edges of said at least two walls, and the lowest of said heater elements on each of said at least two walls being spaced above the bottom edge of said wall from which said floor slopes downwardly,

a heat reflector panel associated with each of said plural walls, said panel having a coefficient of heat reflectivity between about 0.7 and about 1.0, said heat reflector panels being spaced from said tank walls so as to define an air space between said panels and said tank walls around the periphery of said tank, and said plural walls, said heater elements and said reflector panels functioning to define a hot air blanket for each of said plural walls when said cooker is in use to enhance control and homogeneity of the cooking temperature within the tank as established by said heater elements,

an electric circuit that includes said heater elements, said electric circuit cooperating with said heater elements for applying heat to said tank, and

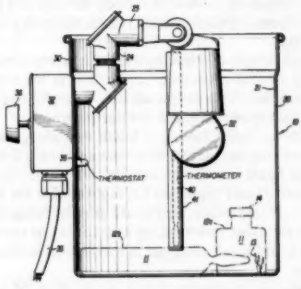
insulation interposed between said heat reflector panels and said housing.

4,273,992

ELECTRIC HEATING APPARATUS FOR HEAT-TREATING PHARMACEUTICALS

Arend J. Thomas, 1361 Chestnut Ave., Annapolis, Md. 21403

Filed Dec. 13, 1979, Ser. No. 103,105
Int. Cl.³ H05B *1/00*; A61M *5/00*; F24C *7/04*
U.S. Cl. 219—521 **3 Claims**



1. An apparatus for heat-treating pharmaceuticals, such as mannitol solutions contained in sealed enclosures, the apparatus comprising:

a receptacle for receiving the sealed enclosure, said receptacle having a reflective inneq surface, an open top and a closed bottom;

a light bulb for providing radiant energy to the interior of said receptacle whereby the energy reflects from the reflective inner surface and onto the sealed enclosures to heat the pharmaceutical therein;

means mounted on the receptacle for supporting the light bulb within the receptacle, beneath the top of the receptacle and in substantial spaced relation to the bottom of the receptacle, wherein the light bulb is above the sealed enclosures, said light bulb and the support being of a dimension less than that of the open top of the receptacle wherein visual observation to the bottom of the receptacle is unobstructed and the presence of sealed enclosures in the receptacle can be determined by looking through the open top of the receptacle, said supporting means including a joint allowing horizontal movement of the light bulb

to provide convenient access to the interior of said receptacle for removal of the sealed enclosures; and

means for controlling the temperature within the receptacle by controlling energy supplied to the light bulb.

4,273,993

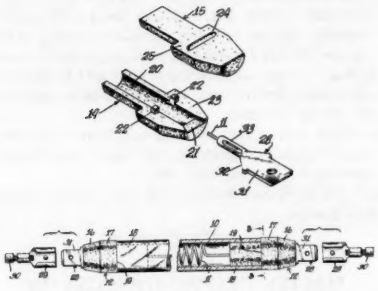
TERMINATIONS FOR ELECTRIC HEATING ELEMENTS

Wayne R. Seeley, Pulaski, Va., assignor to Emerson Electric Co., St. Louis, Mo.

Filed May 12, 1980, Ser. No. 148,821

Int. Cl.³ H05B *3/08*

U.S. Cl. 219—541 **4 Claims**



1. A termination for an electric heater having a tubular sheath and a resistance conductor extending longitudinally within said sheath, said termination comprising,

an end plug for closing an open end of said sheath, said end plug comprising an insulator body formed of a plurality of longitudinal segments which interact laterally to form said end plug,

a metal spade terminal having a tubular portion connected to an end of said resistance conductor, at least one of said segments having a longitudinally-extending recess to receive said spade terminal tubular portion,

said spade terminal having a blade extending axially from said end plug and adapted to connect with a female terminal, the latter being connectable to a power conductor,

at least one of said segments having a socket for receiving a portion of said blade, said blade portion being engageable with a shoulder provided by said socket to restrict movement of said spade terminal in a direction inwardly of said sheath,

said resistance conductor being in the form of a helically-coiled wire which is stressed to resiliently hold said blade portion against said shoulder, and

said end plug having an end portion adapted to seat within said tubular sheath open end.

4,273,994

ROTARY ELECTROMAGNETIC INDICATOR

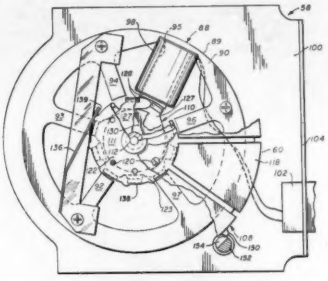
Donald W. Fleischer, Wethersfield, Conn., assignor to Veeder Industries Inc., Hartford, Conn.

Filed Dec. 17, 1979, Ser. No. 104,045

Int. Cl.³ G06M *1/10*

U.S. Cl. 235—92 A **9 Claims**

1. In a rotary electromagnetic indicator comprising an indicating rotor with an even plurality of equiangularly spaced digital indicating positions and having a permanent magnet with an annular arrangement of an even plurality of alternating north and south salient poles for said plurality of equiangularly spaced digital indicating positions respectively, and a stator with a stator core with a plurality of angularly spaced salient poles, each adapted to be aligned with each pole of the rotor permanent magnet as the indicating rotor is rotated by the stator in a forward angular direction through 360°; the improvement wherein the salient poles of the stator core comprises a master salient pole with forward and rearward angular pole face sections in approximately one-half digit out of phase relationship and first and second groups of salient poles with respective pole faces in approximately one-half digit out of phase relationship, each pole face of the first salient pole group being angularly spaced from the rearward pole face section of the master salient pole for respective alignment with rotor poles of opposite polarity, the second salient pole group having



at least one more salient pole than the first group, and each pole face of the second pole group being angularly spaced from the forward pole face section of the master salient pole for respective alignment with rotor poles of opposite polarity, and a stator coil winding on the master salient pole for selectively magnetizing the master salient pole in each direction and the remaining salient poles of the stator in the opposite direction for indexing the rotor one digit in said forward angular direction.

4,273,995

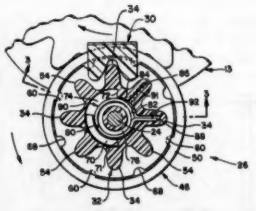
FUEL PUMP COUNTER TRANSFER PINION

Raymond H. Devanney, Winsted, Conn., assignor to Veeder Industries Inc., Hartford, Conn.

Filed Dec. 10, 1979, Ser. No. 101,837

Int. Cl.³ G06C *15/42, 15/26;* B67D *5/22;* F16H *55/18*

U.S. Cl. 235—139 R **14 Claims**



1. In a resettable rotary counter having at least two coaxial resettable counter wheels of ascending order of significance adapted to be rotated in a first angular direction thereof for accumulating a count, and an intermediate rotary torque control transfer pinion having separate coaxial input and output gear sections in operative engagement with adjacent counter wheels of lower and higher order respectively for being intermittently indexed a predetermined transfer angle in one angular direction thereof, by rotation of the lower order counter wheel in said first angular direction, for indexing the higher order counter wheel one count in said first angular direction, the improvement wherein the transfer pinion comprises cooperating abutment means permitting rotation of the input gear section relative to the output gear section in at least said one angular direction from a first relative angular position thereof

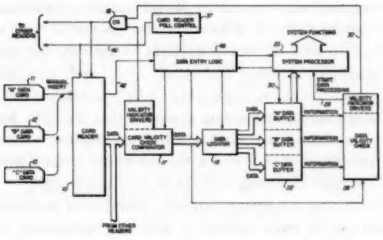
and engageable to accurately establish said first relative angular position, and torsion spring means angularly biasing the abutment means into engagement to angularly bias the output and input gear sections to said first relative angular position and permitting rotation of the input gear section relative to the output gear section in at least said one angular direction against the bias of the torsion spring means, the said relative rotation of the input and output gear sections being at least approximately equal to the predetermined transfer angle of the transfer pinion to permit the input gear section to be dynamically indexed said predetermined transfer angle in said one angular direction by the lower order counter wheel generally independently of the following dynamic rotation of the higher order counter wheel by the output gear section.

4,273,996

SEQUENTIAL CARD READER SYSTEM

Dan G. Weimer, Scottsdale, Ariz., assignor to Engineered Systems, Inc., Tempe, Ariz.

Filed Jun. 25, 1979, Ser. No. 51,988
Int. Cl.³ G06K *7/00, 5/00*
U.S. Cl. 235—435 **4 Claims**



1. A document controlled utilization system responsive to transaction data encoded on two or more documents of a set of documents for use therewith, each document of the set having a portion of the information data for the transaction encoded thereon and having unique locator data identifying the position of the document in the set also encoded thereon, the system including in combination:

document reading means for reading data from documents of a set sequentially inserted therein in any order, each of such documents having a capacity of data which is less than the total amount of the transaction data required by the utilization system;

buffer storage means for storing data read by said reading means and having storage areas equal in number to the number of documents of a set of documents, each of said storage areas being identified by and corresponding to the unique locator data of the document of a set to which said storage area corresponds;

data locator means connected with said reading means and said buffer storage means and responsive to locator data read from documents by said reading means for causing storage of information data read from a document in the one of said storage areas of said buffer storage means corresponding to the unique locator data encoded on such document irrespective of the sequential order in which the documents of a set are inserted into said reading means; and

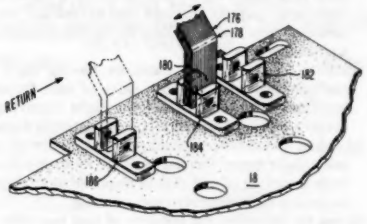
means for coupling said buffer storage means with the utilization system for transferring information from said buffer storage means to the utilization system.

4,273,997

AUTOMATIC PASSBOOK READER/WRITER APPARATUS

Donald L. Bumgardner, South Lyon, and James N. Schreiber, Livonia, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Aug. 3, 1979, Ser. No. 63,422
Int. Cl.³ G06K *7/08, 15/02;* **G11B** *25/04*
U.S. Cl. 235—449 **11 Claims**



5. An automatic bank account passbook reader/writer transport apparatus comprising,

a self contained, unitary, demountable, modular assembly having a data read/write transducer and a synchronizing timing track transducer,

means mounting said transducers for reciprocatory movement relative to an intelligence bearing media,

a demountable flexible timing track disposed adjacent said timing track transducer,

means for moving said transducers back and forth adjacent to said timing track and said intelligence bearing media effective to cause said transducers to alter the intelligence carried by said intelligence bearing media, and

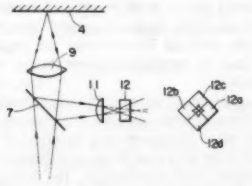
means for coupling said unitary assembly to an operably associated printing apparatus such that information data derived from said intelligence bearing media can be transferred to said printing apparatus for printing upon a record member and recording upon a magnetizable medium carried by said record member, said means mounting said transducers for reciprocatory movement comprising a wear compensating suspension including a shaft supported by bearing means arranged to move in a horizontal plane, and means operably coupled to said bearing means to provide zero clearance regardless of wear.

4,273,998

SERVO UNIT FOR OPTICAL TYPE INFORMATION READING DEVICE

Hitoshi Kanamaru, Tokorozawa, Japan, assignor to Universal Pioneer Corporation, Tokyo, Japan

Filed Jun. 18, 1979, Ser. No. 49,862
Claims priority, application Japan, Jun. 19, 1978, 53-73976
Int. Cl.³ G01J *1/36*
U.S. Cl. 250—204 **6 Claims**



1. In a servo unit in an optical type information reading device having a focussing lens for focussing an irradiation light beam on the record surface of a disk; a movable mirror for positioning the focal point of said irradiation light beam

formed by said focussing lens, on the track of said disk; the improvement comprising:

a cylindrical lens arranged with the central axis of the cylinder forming a 45° angle with the track direction of said disk, thereby allowing a light beam from said record surface to pass through cylindrical lens,

focussing light receiving means having receiving units with light receiving surfaces, said light receiving surfaces having centers arranged on two orthogonal lines, said focussing light receiving means receiving a focus controlling light beam passing through said cylindrical lens at a distance at least twice as long as the focal distance of said cylindrical lens;

tracking light receiving elements having light receiving surfaces provided on both sides of said focussing light receiving means such that the light receiving surfaces receive a pair of tracking controlling light beams;

adjusting means for positioning the focal point of said irradiation light beam formed by said focussing lens on said record surface of said disk in response to an output of said focussing light receiving means; and

means for adjusting the position of said movable mirror so that said focal point is positioned on the track of said disk in response to outputs of said pair of tracking light receiving elements,

said focussing light receiving means arranged so that one of said two orthogonal lines coincides with the cylindrical axis of the cylinder of said cylindrical lens, and

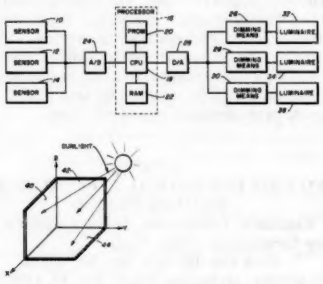
said tracking light receiving elements arranged on a tracking line which forms a 45° angle with said cylindrical axis.

4,273,999

EQUI-VISIBILITY LIGHTING CONTROL SYSTEM

William Pierpoint, Camarillo, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 18, 1980, Ser. No. 113,426
Int. Cl.³ G01J 1/32
U.S. Cl. 250—205 **4 Claims**



1. A method for providing a substantially constant specified relative visibility with time over one or more task areas within a work area having one or more sources of natural daylight to provide natural daylight illumination and one or more luminaires to provide artificial illumination, the illumination provided by the one or more luminaires being variable, said method comprising:

a. determining by measurement the background luminance and the difference luminance for each task area for each of said one or more luminaires as a function of the illumination provided by said one or more luminaires; each luminaire providing full illumination, the background luminance and difference luminance for each task area being a linear function of the illumination provided by each luminaire;

b. determining the background luminance and difference luminance for each task area as a function of the natural daylight illumination entering said work area through said one or more sources of natural daylight, comprising:

b1. sensing the natural daylight illumination entering said work area through said one or more sources of natural light with said sensor means providing a plurality of simultaneous signals related to the intensity of said natural daylight illumination;

b2. measuring the background luminance and difference luminance for each task area with an Equivalent Sphere Illumination meter for each set of three simultaneous sensor signals;

b3. repeating steps b1 and b2 to obtain the simultaneous sensor signals and background luminance and difference luminance readings as the natural daylight illumination varies over time; and

b4. correlating the plurality of simultaneous sensor signals with the background luminance and difference luminance for each task to reestablish the background luminance and difference luminance as a function of the three sensor signals;

c. measuring the natural daylight illumination entering said work area through said one or more sources of natural light, comprising:

disposing sensor means in the path of the sun's rays entering said work area through said one or more sources of natural daylight, a sensor means associated with each said source of natural daylight to measure the natural daylight entering said work area, each said sensor means including a plurality of light detecting surfaces disposed in intersecting planes so that the light detecting surfaces are oriented differently relative to the direction of the sun's rays, the sun's rays thereby striking the light detecting surfaces at a different angle;

d. correlating the present artificial illumination provided by said one or more luminaires with the background luminance and difference luminance at each said task area as a function of the artificial illumination to determine the background luminance and difference luminance at each said task area due to said artificial illumination;

e. correlating the measured natural daylight illumination entering said work area with the background luminance and difference luminance at each said task area as a function of the natural daylight entering said work area to determine the background luminance and difference luminance at each task area due to the natural daylight illumination;

f. calculating the relative visibility at each said task area based on the present difference luminance and background luminance at each said task area due to the combined artificial and daylight illumination;

g. comparing the relative visibility calculated in step f. with the specified relative visibility;

h. varying the artificial illumination from said one or more luminaires to provide the specified relative visibility at each said task area, the artificial illumination being increased by an incremental amount for the luminance producing the maximum relative visibility increase per incremental increase in illumination if the calculated relative visibility is less than the specified relative visibility, the artificial illumination being decreased by an incremental amount for each luminaire if the calculated relative visibility is greater than the specified relative visbility; and

i. continuously periodically repeating step (c) through step (h) to maintain the specified relative visibility.

4,274,000

X-RAY POWDER DIFFRACTOMETER

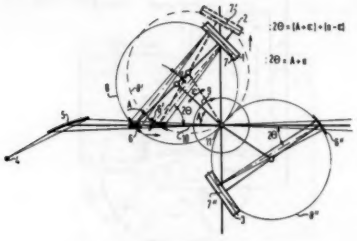
Herbert Goebel, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 16, 1980, Ser. No. 112,463

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1979, 2907160

Int. Cl.³ G01N *23/20*

U.S. Cl. 250—272 5 Claims



5. An X-ray powder diffractometer functioning as a goniometer, comprising: an X-ray source; a sample; a detector means for position sensitive behavior; transport means for advance of the detector means along an arc suited for a Guinier Method for transmission and/or back reflection beam direction and which has a Guinier circle associated therewith; analysis means for preparing an intensity diagram of a local distribution of diffracted radiation for a given position location 2θ of the detector means; the position sensitive detector means being located diametrically opposite the sample on the Guinier circle so as to form an assembly; and the assembly being positioned and rotated in the primary beam such that the primary beam always impinges on the sample and the detector is always in a focus of the diffracted radiation.

4,274,001

SCANNING TYPE SCINTILLATION CAMERA

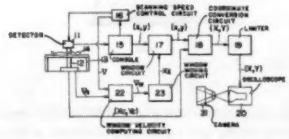
Yasuo Nagasawa, Kashiwa, Japan, assignor to Hitachi Medical Corporation, Japan

Filed Dec. 15, 1978, Ser. No. 969,824

Claims priority, application Japan, Dec. 16, 1977, 52-150586

Int. Cl.³ G01T *1/20*

U.S. Cl. 250—363 S 1 Claim



1. A scanning type scintillation camera arranged that bright spots of radiation are detected while moving the detector of the camera relative to the body of the subject under examination and that the positions of the bright spots noted in a first coordinate system set for the inherent range of detection of the camera are converted to a second coordinate system intended for imaging the whole body of the subject by adding them to or subtracting them from the distance covered by the detector, said scintillation camera further including means for shifting the position of a spatial "window" intended for limiting the detection range of the camera back and forth in the direction of scanning at such speed as will ensure the sum of the velocity of movement of this "window" and the velocity of actual scanning of the detector to always represent a predetermined scanning velocity of this detector.

4,274,002

SCINTILLATION CAMERA

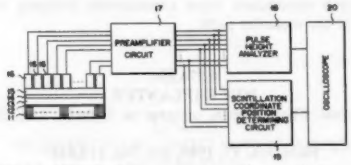
Yutaka Tomita, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Dec. 1, 1978, Ser. No. 965,476

Claims priority, application Japan, Dec. 2, 1977, 52-144867

Int. Cl.² G01T *1/208*

U.S. Cl. 250—366 5 Claims



1. A scintillation camera comprising a collimator for collimating gamma rays, a scintillator disposed on said collimator for converting the gamma rays into photons; a plurality of photo-converter elements arranged in close vicinity to said scintillator; a plurality of preamplifiers connected to said photoconverter elements for amplifying electric signals from said photo-converter elements, respectively; a plurality of nonlinear amplifying means connected between the outputs of each two adjacent amplifiers of said preamplifiers for amplifying the output signals of said two adjacent amplifiers correspondingly to the correlation between said two output signals in accordance with a prescribed nonlinear characteristic, thereby producing two output signals; a plurality of weighting resistor circuits severally connected to the outputs of said nonlinear amplifying means and each including a pair of resistors to which said two output signals of each said nonlinear amplifying means are delivered respectively, said resistors having a resistance value in accordance with one corresponding position of said photo-converter elements; a summing amplifier for adding the output signals of said nonlinear amplifying means through said weighting resistor circuits; and a display device connected to said summing amplifier for displaying an image corresponding to a distribution of the gamma rays in accordance with the signals therefrom.

4,274,003

X-RAY DIAGNOSTIC GENERATOR COMPRISING MEANS FOR OBTAINING A SIGNAL CORRESPONDING TO THE X-RAY TUBE VOLTAGE

Werner Kuehnel, Uttenreuth, and Manfred Rattner, Buckenhof, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 31, 1979, Ser. No. 108,719

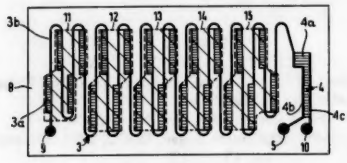
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1979, 2903340

Int. Cl.³ H05G *1/32*

U.S. Cl. 250—409 1 Claim

1. In an x-ray diagnostic generator for supplying an x-ray tube wherein, in order to obtain a signal corresponding to the x-ray tube voltage, a voltage divider comprises resistance means connected in parallel with the x-ray tube, and wherein capacitance means provides a shunt path with respect to said resistance means characterized in that a substrate (8) is provided, the resistance means of the voltage divider (3, 4) comprising resistance portions (3*a*) applied in thick film technique and connected in series to form a meander path on one side of

the substrate (8), and said capacitance means comprising conductive layers (11–15) applied on the other side of the sub-



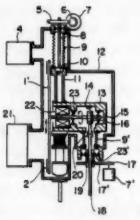
strate, each conductive layer capacitively bridging over a portion of the meander path.

4,274,004

ION IMPLANTER

Norio Kanai, Chofu, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 17, 1980, Ser. No. 112,818
Claims priority, application Japan, Feb. 2, 1979, 54-10377
Int. Cl.³ G21K *5/10*
U.S. Cl. 250—442 **14 Claims**



1. An ion implanter comprising a specimen chamber; a specimen carrier disposed within said specimen chamber; an ion source positioned to direct an ion beam at said specimen carrier to bombard one or more specimen carried thereon; drive means for simultaneously imparting both rotational and rectilinear motion to said specimen carrier; vacuum exhausting means for evacuating said specimen chamber; and means within said specimen chamber for enclosing said drive means so as to completely isolate said drive means from the atmosphere of said specimen chamber.

4,274,005

X-RAY APPARATUS FOR COMPUTED TOMOGRAPHY SCANNER

Toshio Yamamura; Takeshi Muraki, both of Yokohama, and Heihachi Miura, Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 14, 1979, Ser. No. 66,765
Claims priority, application Japan, Sep. 29, 1978, 53-119205
Int. Cl.³ G03B *41/16*
U.S. Cl. 250—445 T **24 Claims**

1. An X-ray apparatus for a computed tomography scanner which has a central axis thereof, comprising:

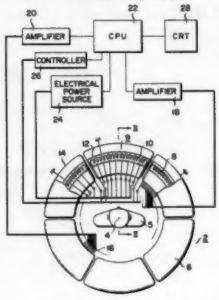
two or more X-ray tube segments each segment including:

means for generating electron beams,

a target substantially extending along a circular arc around the central axis and adapted to be scanned by the electron beams to emit X-rays toward the central axis, and

an airtight envelope receiving said electron beam generating means, said target having a metal member made of good heat conductive material and having an inner surface on which said target is supported and an outer surface,

said X-ray tube segments combinedly arranged along the circular arc and each metal member of an X-ray tube segment being coupled to the adjacent metal members of adjacent X-ray tube segments to provide a circular array of such metal members;



X-ray detecting means comprising a plurality of detector elements for detecting the X-ray beams transmitted through a central region including the central axis; and

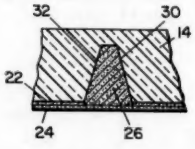
means for cooling said target including a liquid-cooling jacket fitted to said metal members defining a coolant circulating path between the outer surface of the circular array of the metal members and the liquid-cooling jacket.

4,274,006

UNIVERSAL X-RAY FILM MARKER

Richard D. Caine, 13352 Sayre St., Sylmar, Calif. 91340

Filed Jan. 17, 1980, Ser. No. 112,947
Int. Cl.³ G03B *41/16*
U.S. Cl. 250—476 **8 Claims**



1. An X-ray film indentification plate of universal applicability including tomographic and other applications where there is a change in the angle of incidence of the X-rays on the film, comprising:

a plastic plate carrying letters which may be read from the front of said plate, said plate being substantially transparent;

recesses forming the outline of said letters extending into said plate from the rear of said plate, and recesses being wider at the rear surface of said plate and tapering to a substantially narrower width at the end of each said recess near the front of said plate;

lead powder mounted in said recesses;

means including a hardened binder material firmly securing said lead powder into letter form in said recesses; and

a thin plastic layer secured to and covering the back of said plate.

4,274,007

RADIATION-SHIELDING TRANSPORT AND STORAGE VESSEL

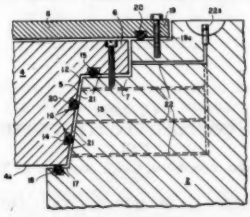
Henning Baatz, Essen, and Dieter Rittscher, Heiligenhaus, both of Fed. Rep. of Germany, assignors to GNS Gesellschaft für Nuklear-Service mbH, Essen, Fed. Rep. of Germany

Filed Feb. 8, 1980, Ser. No. 120,108

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1979, 2905094

Int. Cl.³ G21F *5/00*

U.S. Cl. 250—506 **7 Claims**



1. A radiation shielding transport and storage vessel comprising:

a cast metal upright receptacle having a wall surrounding a space adapted to receive radioactive material and a bottom unitary with said wall, said space opening at the top of said vessel in a recess;

a plug-type radiation-shielding cover received in said recess and complementarily fitting said space, whereby said recess and said cover have complementary and confronting surfaces;

a plurality of annular seals disposed between and bridging said surfaces so as to define at least one control compartment between;

means forming at least one passage accessible from outside the vessel and communicating with said control compartment for monitoring a control gas in said vessel; and

a safety cover overlying said plug cover and peripherally overhanging same while being recessed in said receptacle.

4,274,008

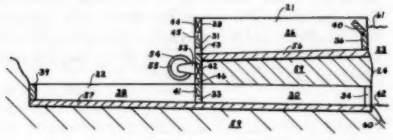
TIDE GENERATOR

Bruce D. Feltenberger, 404 W. 10th St., Erie, Pa. 16501

Filed Dec. 18, 1978, Ser. No. 970,640

Int. Cl.³ F03B *13/12*

U.S. Cl. 290—42 **9 Claims**



1. A tidewater power system comprising a high tide water reservoir (**21**) and a low tide water reservoir (**30**) disposed below said high tide water reservoir,

said reservoirs being adapted to be disposed adjacent a body of water subject to tidal action wherein the level of said water changes periodically from high tide level to low tide level,

said high tide reservoir having an inlet gate adjacent said body of water and an outlet,

said low tide reservoir having a bottom disposed substantially at said low tide water level,

said outlet from said high tide reservoir being on the side of said high tide reservoir remote from said body of water,

said low tide reservoir being disposed to receive water discharged from said outlet gate from said high tide reservoir,

drain lines from said low tide reservoir for returning water from said low tide reservoir to said body of water at low tide,

and a water wheel supported on the side of said high tide reservoir and said low tide reservoir remote from said body of water between said high tide reservoir and said low tide reservoir in the path of water from said high tide reservoir to said low tide reservoir whereby water from said outlet gate acts on said wheel driving it to generate electricity.

4,274,009

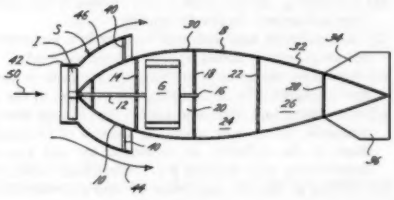
SUBMERGED HYDROELECTRIC POWER GENERATION

George Parker, Sr., 3105 Brawner Pkwy., Corpus Christi, Tex. 78415

Continuation-in-part of Ser. No. 854,651, Nov. 25, 1977, abandoned. This application Nov. 9, 1978, Ser. No. 959,217

Int. Cl.³ F03B *13/10*

U.S. Cl. 290—43 **27 Claims**



1. An apparatus for generating energy in response to the flow of fluid therepast while submerged in a body of water, comprising

a body member having a streamlined external configuration from a front end to a rear end thereof for ease of water flow therepast;

a rotatable energy converting device mounted in said body member for converting, when driven, energy of rotation into a second type of energy;

an impeller blade rotatably mounted with said front end of said body member for driving said energy converting device in response to flow of water therepast; and

an inlet shroud mounted with said front end of said body member and containing said impeller blade therein, said inlet shroud comprising

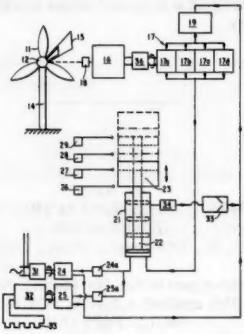
an inlet for conveying the water to said impeller blade; and

a guide shroud, overlapping said body member and having a terminal edge spaced from said body member, for diverting water flowing externally of the apparatus to an angle transverse the horizontal flow and discharging the externally flowing water along said terminal edge at a location spaced from said body member, the guide shroud comprising means for generating a nappe, exhibiting lower pressure than water surrounding said body member, bounded in part by said terminal edge and the exterior of said body member, the nappe communicating with the inlet shroud and reducing the water pressure within said shroud to cause flow of the water past said impeller blade.

4,274,010
ELECTRIC POWER GENERATION

Henry Lawson-Tancred, Boroughbridge, England, assignor to Sir Henry Lawson-Tancred, Sons & Co., Ltd., Yorkshire, England

Filed Nov. 29, 1977, Ser. No. 855,688
Claims priority, application United Kingdom, Mar. 10, 1977, 10085/77; Apr. 26, 1977, 17272/77
Int. Cl.³ F03D *9/02*
U.S. Cl. 290—55 **11 Claims**

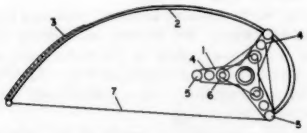


1. A method for generating electricity comprising:
(a) converting energy from a non-uniformly operating energy source into hydraulic energy,
(b) accumulating said hydraulic energy in a piston-in-cylinder arrangement acting against a constant load,
(c) measuring the amount of hydraulic medium in the cylinder by electrically determining the position of the piston,
(d) converting said hydraulic energy into kinetic energy in a hydraulic motor only when the amount of hydraulic medium in the cylinder, as measured by said electrically determining step, exceeds a predetermined value, and
(e) driving an electric generator by said hydraulic motor.

4,274,011
WIND TURBINE FOR MARINE PROPULSION

Marvin Garfinkle, 943 E. McPherson St., Philadelphia, Pa. 19150

Filed Mar. 14, 1980, Ser. No. 130,512
Int. Cl.³ B63H *13/00;* **F03D** *9/00*
U.S. Cl. 290—55 **5 Claims**

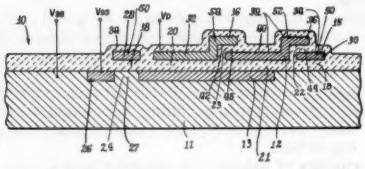


1. A wind turbine mechanically connected to electric generating means wherein the action of the wind upon said turbine causes rotation of said turbine about an essentially vertical mast thereby converting wind power to electric power for the propulsion motors of a screw-propelled ship comprised of a number of hubs rotatably mounted and equally spaced along the length of a vertical mast;
each of said hubs supporting radially disposed arms equally spaced about the circumference of said hubs;
said arms vertically alligned by torque tubes coaxial with said mast and situated between adjacent hubs and connected to them;
two horizontally disposed flexible yards vertically alligned with each other and sufficiently spaced apart to form a slot between them, said yards secured tangentially to the end of each of said arms;
all of each set of vertically alligned yards secured at their yardarms by a vertically disposed and circumferentially situated brace member;
each of said brace members secured by cables, said cables spaced in said slots and alligned by sheaves rotatably mounted upon each of said arms;
the free length of each of said cables controlled by a windlass rotatably mounted upon each of said arms;
and sail cloth secured to said yards, said sail cloth stretched between adjacent yards of said adjacent hubs.

4,274,012
SUBSTRATE COUPLED FLOATING GATE MEMORY CELL

Richard T. Simko, Los Altos, Calif., assignor to Xicor, Inc., Los Altos, Calif.

Filed Jan. 24, 1979, Ser. No. 6,030
Int. Cl.³ H03K *5/00;* **H01L** *29/78, 27/02;* **G11C** *11/34*
U.S. Cl. 307—238.3 **26 Claims**



1. A nonvolatile electrically alterable semiconductor device comprising
a semiconductor layer of one conductivity type, an electrically isolatable bias electrode at the surface of said semiconductor layer, and of conductivity type opposite that of said substrate, an electrically isolated floating gate conductor overlying said bias electrode and in capacitive relationship therewith, a programming electrode adjacent said floating gate for introducing electrons to said floating gate, an erase/store electrode adjacent said floating gate for removing electrons from said floating gate upon the development of an electrical field between said floating gate and said erase/store electrode, said erase/store electrode overlying and being in capacitive relationship to said bias electrode, means for electrically isolating said bias electrode and for providing a predetermined electrical potential thereto, and means for sensing the electrical potential of said floating gate.

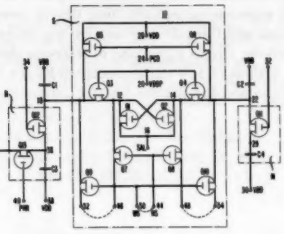
4,274,013
SENSE AMPLIFIER

Donald G. Clemons, Walnutport, and William R. Huber, III, Center Valley, both of Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 9, 1979, Ser. No. 10,740
Int. Cl.³ G11C *7/00*
U.S. Cl. 307—530 **9 Claims**

1. Circuitry comprising cross-coupled circuitry (Q1, Q2) having first (12) and second (14) inner terminals and first (18) and second (22) outer terminals and separate buffer means (Q3, Q4) serially connected between the first inner and outer terminals (12, 18) and between the second inner and outer terminals

(14, 22), and read circuitry (Q7, Q8) and write circuitry (Q9, Q10), and characterized in that:



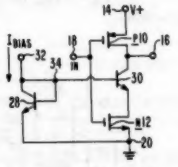
the read circuitry (Q7, Q8) is connected to the pair of inner terminals (14, 12) and the write circuitry (Q9, Q10) is connected to the pair of outer terminals (18, 22).

4,274,014

SWITCHED CURRENT SOURCE FOR CURRENT LIMITING COMPLEMENTARY SYMMETRY INVERTER

Otto H. Schade, Jr., N. Caldwell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 1, 1978, Ser. No. 965,581
Int. Cl.³ H03K *17/60*
U.S. Cl. 307—585 **9 Claims**



1. A switched current source for selectively supplying load means a predetermined level of output current in response to a first level of a binary-signal control voltage and for completely interrupting the supplying of output current responsive to a second level of control voltage, said switched current source comprising:

first and second and third transistors, of similar conductivity type, each having respective first and second electrodes that define the ends of its respective principal current conduction path and having respective third electrode, the potential between its first and third electrodes controlling the conduction of its principal current conduction path, said first and second transistors requiring voltages between their first and third electrodes that exceed substantially equal threshold values for conditioning each of them to conduct between its first and second electrodes;

a first terminal for receiving a first operating potential to which the first electrodes of said first and third transistors connect without substantial intervening impedance;

a second terminal for receiving said control voltage at the third electrode of said third transistor, a first level of said control voltage conditioning said third transistor for conduction between its first and second electrodes and a second level of said control voltage conditioning said third transistor for non-conduction between its first and second electrodes;

a third terminal connecting to said load means for conducting said output current, to which third terminal the second electrode of said second transistor connects; and

means connecting said first and second transistors for functioning as a current mirror amplifier whenever said third transistor conducts between its first and second electrodes, to constrain said output current to a prescribed level proportional to a first bias current, that means additionally including

a connection without substantial intervening impedance between the first electrode of said second transistor and the second electrode of said third transistor,

means for supplying said first bias current to a first node to which the second electrode of said first transistor connects, and

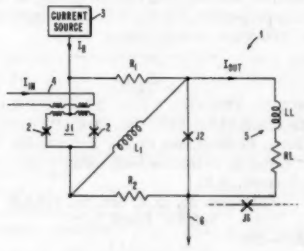
means direct coupling said first node to an interconnection between the third electrodes of said first and second transistor for completing a direct coupled feedback loop that conditions said first transistor to conduct substantially all of said first bias current through its principal current conduction path.

4,274,015

SELF-RESETTING JOSEPHSON DIGITAL CURRENT AMPLIFIER

Sadeg M. Faris, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1978, Ser. No. 974,652
Int. Cl.³ H03K *5/02, 3/38*
U.S. Cl. 307—264 **27 Claims**



1. A digital current amplifier comprising:

a current source which provides a given current magnitude,

a first superconducting switchable device connected to said current source,

a load circuit, and,

inductive means interconnecting said current source and said load circuit for applying a current magnitude greater than said given current magnitude to said load circuit, said inductive means including a first resistance and an inductance disposed in series with each other and connected in parallel with said first device, a second superconducting switchable device connected in parallel with said load circuit, a second resistance disposed in series with said second device, the latter and said second resistance being connected in parallel with said inductance.

4,274,016

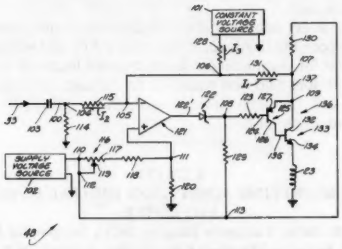
VOLTAGE-TO-CURRENT CONVERTER

Iraj Ghahramani, Los Angeles, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Feb. 7, 1979, Ser. No. 10,021
Int. Cl.³ H03K *3/01*
U.S. Cl. 307—270 **25 Claims**

1. A voltage-to-current converter comprising a differential amplifier having an inverting input, a non-inverting input and an output lead for carrying an output signal; an input voltage source having an output voltage including an A.C. component; an unregulated supply voltage source; a regulated supply voltage source; an output voltage junction; first means connected from said unregulated source to said non-inverting input to maintain it at an approximately predetermined potential; a first resistor connected from said input source to said inverting input; a second resistor connected from said regulated source

to said inverting input; a feedback resistor connected from said output junction to said inverting input; a third resistor connected from said unregulated source to said output junction; an inductive winding having a grounded end and an end opposite said grounded end; a controllable current path between said output junction and said inductive winding opposite end; and



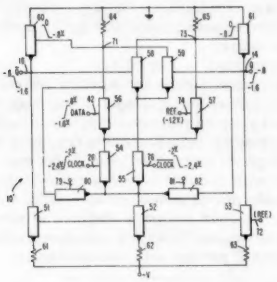
second means connected from said differential amplifier output lead to control said current path in a manner to cause said inverting input to be driven effectively to the same potential as said noninverting input potential and to cause a current to flow in said inductive winding, said current having an A.C. component directly proportional to the A.C. component of the output voltage of said input voltage source.

4,274,017

CASCODE POLARITY HOLD LATCH HAVING INTEGRATED SET/RESET CAPABILITY

Eric L. Carter, Endicott, and Eugene J. Nosowicz, Vestal, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 26, 1978, Ser. No. 973,426
Int. Cl.³ H03K 3/29
U.S. Cl. 307—289 **1 Claim**



1. In a polarity hold latch circuit having a plurality of semiconductor switching devices interconnected to provide a bistable circuit and including, a first semiconductor switching device coupled to such bistable circuit and having an input terminal for receiving a binary data signal, a second semiconductor switching device coupled in circuit with the first semiconductor switching device and having an input terminal for receiving a clock signal to assist in enabling the binary level of the data signal supplied to the first device to determine the state of the bistable circuit and a third semiconductor switching device for supplying a reference voltage source under predetermined input conditions also coupled in the bistable circuit through its output between said first and second devices to assist in enabling, upon receipt of a clock signal by the second device, a change in the state of the bistable circuit, the improvement comprising:

a fourth semiconductor switching device coupled across the first and second device and having an input terminal for receiving a set signal and in response thereto overriding the actions of any signals received by the first and second devices and forcing the bistable circuit to a set state; and

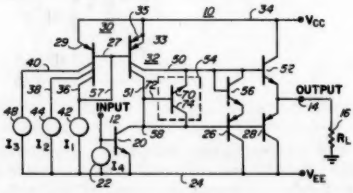
a fifth semiconductor switching device coupled across the second and third devices and having an input terminal for receiving a reset signal and in response thereto overriding the actions of any signals received by the first and second devices and forcing the bistable circuit to a reset state.

4,274,018

SATURATION LIMITED BIAS CIRCUIT FOR COMPLEMENTARY TRANSISTORS

David L. Cave, and Robert B. Davies, both of Tempe, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 2, 1979, Ser. No. 60
Int. Cl.³ H03K 19/003, 19/082
U.S. Cl. 307—300 **7 Claims**



1. A circuit for limiting the saturation of a multiple collector transistor of a first conductivity type having at least first and second collector electrodes, including in combination:

driver circuit means having an output terminal thereof connected to the first collector electrode of the multiple collector transistor, said driver circuit means tending to allow the first collector-to-base junction of the multiple collector transistor to forward bias thereby forcing said multiple collector transistor into a high degree of saturation;

output transistor means having a control electrode connected to the second collector electrode of the multiple collector transistor; and

clamp transistor means of the second conductivity type having a control electrode connected to the first collector electrode, a first main electrode connected to said output terminal of said driver circuit means, and a second main electrode connected to the second collector electrode and to said control electrode of said output transistor means, said clamp transistor means being rendered conductive in response to the potential at the output terminal of the driver circuit means approaching the saturation level of the first collector-to-base junction of the multiple collector transistor so that at least part of the current otherwise provided through the first collector-to-base junction of the multiple collector transistor is provided to said control electrode of said output transistor means.

4,274,019
LIQUID-METAL MAGNETOHYDRODYNAMIC CONVERTER

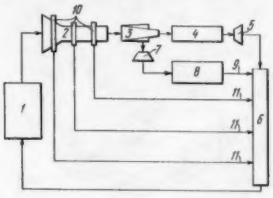
Ivan T. Aladiev, ulitsa Marshala Birjuzova, 43, kv. 21, Moscow; Vazha A. Dzhamardzhashvili, ulitsa Guramishvili, 17, kv. 61; Manana A. Dikhashidze, ulitsa Bakhtrionskaya, 1 korpus, kv. 21, both of, Tbilisi; Sergei V. Teplov, Leninsky prospekt, 52, kv. 54, Moscow, and David G. Tskhvirashvili, ulitsa Kipshidze, 6, kv. 14, Tbilisi, all of U.S.S.R.

Filed Jul. 12, 1979, Ser. No. 56,844

Claims priority, application U.S.S.R., Jul. 14, 1978, 2645231

Int. Cl.³ H02K *45/00*

U.S. Cl. 310—11 **2 Claims**



1. A liquid-metal magnetohydrodynamic converter comprising:

a heat source having an inlet and an outlet;

a two-phase nozzle having an inlet and an outlet and hydraulically connected via said inlet thereof to said outlet of said heat source;

steam-bleeding units of said two-phase nozzle located in different sections of said two-phase nozzle over its length, each having individual outlets;

a separator having an inlet, a first outlet and a second outlet and hydraulically connected via said inlet thereof to said outlet of said two-phase nozzle;

a magnetohydrodynamic generator having an inlet and an outlet and hydraulically connected via said inlet thereof to said first outlet of said separator;

a liquid diffuser having an inlet and an outlet and hydraulically connected via said inlet thereof to said outlet of said magnetohydrodynamic generator;

a cyclic heat-regenerating means having an inlet, a group of steam inlets to suit the number of said steam-bleeding units and an outlet and hydraulically connected via said inlet thereof to said outlet of said liquid diffuser, via said steam inlets to said outlets of said steam-bleeding units and via said outlet to said inlet of said heat source;

a steam diffuser having an inlet and an outlet and hydraulically connected via said inlet thereof to said second outlet of said separator;

a condenser having an inlet and an outlet and hydraulically connected via said inlet thereof to said outlet of said steam diffuser and via said outlet to said inlet of said heat-regenerating means.

4,274,020
SYNCHRONOUS LINEAR MOTOR

Claus P. Parsch, Forchheim, and John P. Gibson, Fürth-Vach, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

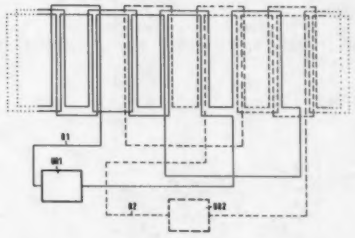
Filed Sep. 26, 1979, Ser. No. 79,101

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1978, 2842099

Int. Cl.³ H02K *41/02*

U.S. Cl. 310—13 **1 Claim**

1. In a synchronous linear motor, especially a long stator motor, the excitation device of which is designed as a moving translator and is arranged on a track-bound vehicle, having a traveling field winding divided into switching sections which are installed in meander fashion along the line and supplied from respective stationary controlled static converters, the current carrying rails of the traveling field winding being designed as conductor ribbons with several individual conductors, the improvement comprising, at a change of switching sections, the individual conductors of the conductor ribbons



being sequentially interchanged in such a manner that, at intervals which correspond to an integral multiple of a pole pitch division, successive individual conductors of the one switching section are brought out and individual conductors of the next switching section looped in.

4,274,021
LIQUID COOLED STATOR WINDING FOR A ROTARY ELECTRIC MACHINE HAVING REDUCED THERMAL ELONGATION STRESSES

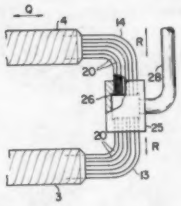
Hiroyuki Kamiya; Seiji Watanabe; Masatosi Taniguchi; Tomokichi Okawara; Fumitake Aki, all of Hitachi, and Yasuyuki Wachi, Takahagi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 775,747, Mar. 9, 1977, abandoned. This application Mar. 8, 1979, Ser. No. 18,526

Claims priority, application Japan, Mar. 12, 1976, 51-26152

Int. Cl.³ H02K *9/00*

U.S. Cl. 310—54 **3 Claims**



1. A liquid cooled stator winding of a rotary electric machine comprising an upper and a lower stator bar each composed of a plurality of hollow conductive elements, said bars being disposed partly within a slot of a stator core and extending outwardly from the stator core in a generally axial direction thereof, and a liquid coolant header coupled to a coolant pipe for supplying a cooling liquid to the header, said headeh being fixedly mounted on the ends of said stator bars by heat welding for directly cooling the conductive elements by circulating liquid coolant through the hollow passages of the conductive elements, wherein said stator bars are bent at their end portions to enter said header in a direction generally radial with respect to the axis of the rotary electric machine so as to oppose each other at their ends, and said header is interconnected between the opposed ends of said stator bars, wherein said liquid coolant header comprises a sleeve having a pair of counterbores at its opposite ends with the hollow conductive elements constituting each of said bars being secured, at their end portions, into a respective one of said counterbores of the header.

4,274,022
EVACUATING DEVICE FOR GENERATING AN INSULATING VACUUM AROUND THE SUPERCONDUCTING WINDING OF A ROTOR

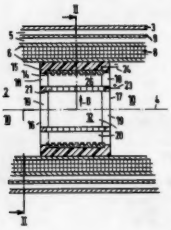
Werner Elsel, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 16, 1979, Ser. No. 39,654

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1978, 2826501

Int. Cl.³ H02K *9/00*

U.S. Cl. 310—62 **6 Claims**



1. In an evacuating device for generating an insulating vacuum around the superconducting winding of the rotor of an electric machine with an inner space which is defined at its inner circumference by a support cylinder and is surrounded by the winding and is permeated by the magnetic field of the winding, comprising at least one ion getter pump operating according to the sputter principle, disposed in the inner space coupled to the support cylinder so as to co-rotate with the rotor, said pump having at least one anode electrode and at least a cathode electrode arranged at least approximately perpendicular with respect to the magnetic field in said space.

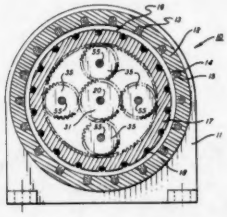
4,274,023
COMPACT VARIABLE SPEED DRIVE FOR ELECTRIC MOTOR

Donald F. Lamprey, 114 Glenwood Dr., Liverpool, N.Y. 13088

Filed May 10, 1979, Ser. No. 37,682

Int. Cl.³ H02K *7/10*

U.S. Cl. 310—83 **4 Claims**



1. An electric motor having stationary stator windings secured to the motor casing and rotor windings supported within the stator windings for rotation about the axis of the motor, the motor further including

an internal ring gear formed as an integeral part of the rotor windings whereby the ring gear turns with said rotor windings,

a main drive shaft rotatably supported within the casing along the axis of the motor,

a sun gear secured to the main shaft for rotation therewith within the ring gear, and

a planetary gear cluster mounted in meshing engagement with the sun gear and the ring gear whereby the shaft is driven directly through the gears by the rotor windings.

4,274,024
SELF-STARTING SYNCHRONOUS MOTOR WITH DEFINED DIRECTION OF ROTATION

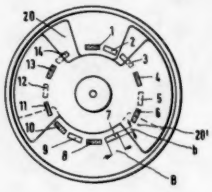
Detlef Gottschalk, Berlin, Fed. Rep. of Germany, assignor to Schleicher GmbH & Co. Relais-Werke KG, Berlin, Fed. Rep. of Germany

Filed Mar. 29, 1979, Ser. No. 24,993

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1978, 2829946

Int. Cl.³ H02K *21/12*

U.S. Cl. 310—162 **4 Claims**



1. A self-starting synchronous motor having a defined direction of rotation, a permanent magnetic rotor and a claw-pole type stator, said synchronous motor comprising:

an operating winding having a plurality of poles with several poles being combined to form main pole groups and auxiliary pole groups, said auxiliary pole groups being loaded with short-circuiting discs;

said synchronous motor having a defined direction of rotation which is not preset by means of a directional blockage;

said poles being located on a circular ring and disposed so as to protrude from oppositely located frontal sides of said stator; and

said poles being combined to form two main pole groups and two auxiliary pole groups in which the total number of main poles is smaller than the total number of auxiliary poles, an equal number of main poles protrude from each of both of said frontal sides of said stator and an equal number of auxiliary poles protrude from each of both of said frontal sides of said stator.

4,274,025
POLYESTER FILMS CONTAINING SUBSTANTIALLY SPHERICAL PARTICLES USEFUL AS SLOT LINERS

Mohanlal S. Nerurkar, Welwyn Garden City, and Peter G. Knowles, Luton, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 781,870, Mar. 28, 1977, abandoned. This application Apr. 6, 1979, Ser. No. 27,841

Claims priority, application United Kingdom, Apr. 29, 1976, 17489/76

Int. Cl.³ C08K *3/36*; H02K *3/34*

U.S. Cl. 310—215 **9 Claims**

1. A slot liner or slot closure for an electrical machine produced from a film or sheet of a linear polyester which contains particles of an inert inorganic material present in an amount ranging from 0.2 to 0.9% by weight based on the weight of the linear polyester, said particles having a substantially spherical shape and a nominal particle size ranging from 3 to 10 μm and a hardness measured on the moh scale ranging from 2.5 to 7, said slot liner or slot closure having a static coefficient of friction in the range 0.30 to 0.38 and a kinetic coefficient of friction in the range of 0.27 to 0.36.

9. A process for the production of a slot liner or slot closure for an electrical machine in which the slot liner or slot closure

is cut and shaped from a film or sheet of a linear polyester which contains particles of an inert inorganic material present in an amount ranging from 0.2 to 0.9% by weight based on the weight of the linear polyester, said particles having a substantially spherical shape and a nominal particle size ranging from 3 to 10 μm and a hardness measured on the moh scale ranging from 2.5 to 7.

4,274,026

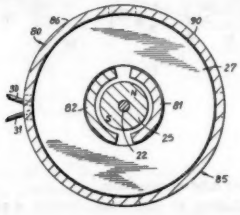
ELECTRIC ROTATING MACHINE

Arthur W. Haydon, Middlebury, and John J. Dean, Oxford, both of Conn., assignors to Tri-Tech, Inc., Waterbury, Conn.

Continuation-in-part of Ser. No. 864,395, Dec. 27, 1977. This application Nov. 9, 1978, Ser. No. 959,010

Int. Cl.³ H02K *1/14*

U.S. Cl. 310—254 **11 Claims**



1. An electric rotating machine comprising, in combination:

a thin cylindrical rotor having a pair of rotor poles;

a stator pole piece assembly having first and second sets of salient stator poles respectively cooperating with different portions of the rotor, there being not more than two salient stator poles in each of said sets and the stator poles in the respective sets being angularly spaced apart by approximately ninety electrical degrees with at least one of said stator poles subtending an angle of at least about one hundred and twenty mechanical degrees with respect to the axis of said rotor, each of said stator poles being in magnetic flux relationship with said pair of rotor poles;

first and second field coils for supplying magnetic flux to the respective sets of salient stator poles; and

means for applying current to the first and second field coils to produce a magnetic flux field in each of said sets of stator poles.

4,274,027

SALIENT POLE ROTOR WITH SHIELDING RODS BETWEEN ADJACENT POLES

Shigeo Higuchi, Hitachiota; Tsutomu Iwasaki, Mito; Koji Sato, Hitachi; Yukio Hirama, Hitachi; Masatoshi Watanabe, Hitachi; Yasuyuki Wachi, Takahagi, and Yasuhiro Yasaka, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

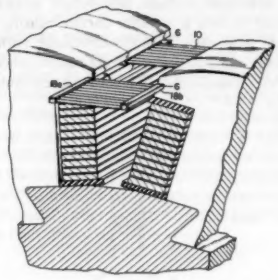
Filed Sep. 20, 1979, Ser. No. 77,734

Claims priority, application Japan, Sep. 20, 1978, 53-114556

Int. Cl.³ H02K *1/24*

U.S. Cl. 310—269 **14 Claims**

1. A rotor for electric rotating machine comprising; a rotor rim, a plurality of salient poles mounted around said rotor rim, each of said salient poles including a field core secured to said rotor rim and a field coil wound around the core, and a plurality of shielding rod assemblies mounted between every adjacent two of said field cores so as to provide said rotor with a substantially cylindrical configuration each of said rod assemblies comprising a plurality of rod members extending transversely and closely side by side between the associated adjacent two field cores and fixed at their respective opposing ends



into slots formed in respective opposing sides of said adjacent two field cores.

4,274,028

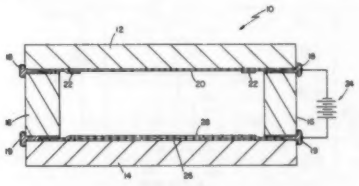
ULTRAVIOLET LIGHT GENERATION

Norman J. Frame, Milwaukee, Wis., assignor to W. H. Brady Company, Milwaukee, Wis.

Continuation of Ser. No. 948,978, Oct. 5, 1978, abandoned. This application Aug. 13, 1979, Ser. No. 66,059

Int. Cl.³ H01J *63/06, 40/06, 31/50*

U.S. Cl. 313—101 **15 Claims**



1. Apparatus for generating high intensity ultraviolet light, comprising

an input substrate,

an electron-emitting cathode layer on said input substrate,

an output window,

a cathodoluminescent anode layer on said output window, said layer comprising phosphor luminescent in substantially only the ultraviolet spectrum,

an evacuated region separating said cathode and anode layers, and

a D.C. voltage source connected across said layers for generating a longitudinal electric field,

whereby electrons emitted by said cathode layer are accelerated by the electric field through said evacuated region and impinge on said cathodoluminescent layer causing a substantially pure, high-intensity ultraviolet light output through said output window.

4,274,029

GAS DISCHARGE DEVICE WITH METAL OXIDE CARRIER IN DISCHARGE PATH

Charley Buxbaum, Baden, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Apr. 6, 1979, Ser. No. 27,734

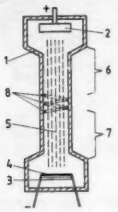
Claims priority, application Switzerland, Apr. 28, 1978, 4628/78

Int. Cl.³ H01J *61/10, 61/26, 61/30*

U.S. Cl. 313—204 **14 Claims**

1. A gas discharge device containing oxide wall portions,

which device is used as a radiation source and the oxide wall portions of which are permeable to radiation of a wavelength of from 10 to 1,000 nm and which has an anode and an oxide or sub-oxide activated cathode, and which device further contains located therein a metallic carrier bearing an additional metal oxide extending into the discharge path between the anode and the oxide or sub-oxide activated cathode, on the side of the device immediately adjacent to the cathode, between the



cathode and the oxide wall portions, wherein said additional metal oxide has a free enthalpy ΔG, under the pressure and temperature conditions prevailing in the device, which is both greater than the free enthalpy of the oxides from which the oxide wall portions of the device are constructed and is greater than the free enthalpy of the cathode activating oxide or sub-oxide and wherein the metallic carrier is insulated from the other parts of the device and is at a floating potential.

4,274,030

THERMIONIC CATHODE

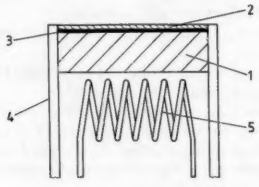
Charley Buxbaum, Baden, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Apr. 3, 1979, Ser. No. 26,649

Claims priority, application Switzerland, May 5, 1978, 4890/78

Int. Cl.[3] **H01J** *1/14, 19/06;* **H01K** *1/14*

U.S. Cl. 313—346 R **9 Claims**



1. A thermionic dispenser cathode comprising:

a high-melting point metal support comprising an activator substance in the form of an oxide of a metal of group IIIb and a reducing agent in the form of a carbide of the metal support;

a layer of diffusion promoting additive for promoting diffusion of the activator substance; and

a layer of material on said metal support beneath the diffusion promoting layer for inhibiting self-diffusion of the diffusion-promoting additive inwards away from the active cathode surface.

4,274,031

COLOR TUBE HAVING SHIELD CORRECTING FOR TERRESTRIAL MAGNETISM

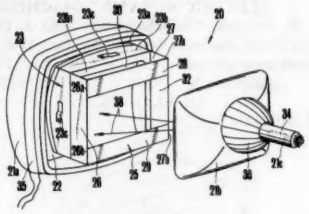
Yuji Saito, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Japan

Filed Feb. 12, 1979, Ser. No. 11,633

Claims priority, application Japan, Feb. 17, 1978, 63-17805

Int. Cl.[3] **H01J** *29/06, 29/07, 29/81*

U.S. Cl. 313—407 **3 Claims**



1. A color picture tube comprising:

an envelope including an end panel having a plurality of stripe-shaped phosphors thereon forming a fluorescent viewing screen, a funnel portion and a neck portion;

a shadow mask assembly disposed in the enlarged end of said funnel portion at a predetermined distance from said end panel, said shadow mask assembly including a rectangular supporting frame and a shadow mask supported thereby on the side thereof facing said end panel, said rectangular supporting frame comprising a pair of vertically extending short sides and a pair of horizontally extending long sides, said frame being open on the side thereof away from the end panel;

a demagnetizing coil surrounding the enlarged end of said funnel portion in the vicinity of said shadow mask assembly;

a terrestrial magnetism correcting assembly comprising a pair of terrestrial magnetism correcting vertical side plates having the planar surfaces thereof substantially at right angles to the plane of the end panel, said vertical side plates being disposed adjacent respective short sides of the rectantular supporting frame and being of substantially the same length, and a pair of horizontal side plates extending in the direction of the long sides of said rectantular supporting frame and having the planar surfaces thereof substantially perpendicular to the vertical side plates and parallel to the end panel, said horizontal side plates being disposed at the top and the bottom ends of said terrestrial magnetism correcting vertical side plates on the sides thereof away from said end panel to thereby form open spaces between said pair of horizontal side plates and said pair of horizontally extending long sides of said supporting frame for the shadow mask assembly to reduce magnetic coupling between said demagnetizing coil and the terrestrial magnetism correcting assembly and to improve the flow of thermal convection currents away from said shadow mask assembly; and

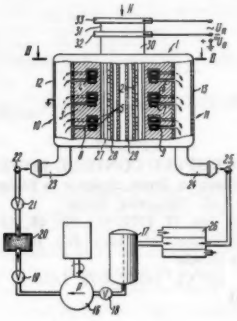
an electron gun assembly contained in said neck portion for producing an electron beam that is projected through said funnel portion, the terrestrial magnetism correcting assembly and the shadow mask assembly to selectively impinge on the stripe-shaped phosphors formed on said end panel.

4,274,032

HIGH POWER LIQUID COOLED DOUBLE STRAPPED VANE TYPE MAGETRON

Jury I. Dodonov, Profsojuznaya ulitsa, 93, korpus 2, kv. 384, Moscow, and Valentina F. Obidina, poselok Mosrentgen, 6, kv. 35., Moskovskaya oblast, both of U.S.S.R.

Filed Jul. 6, 1979, Ser. No. 55,441
Int. Cl.³ H01J *25/50*
U.S. Cl. 315—39.51 **2 Claims**



1. A high power liquid cooled double strapped vane type magnetron, comprising:

a generally cylindrical anode block having a plurality of circumferentially disposed evacuated resonator cavities therein, with vanes separating adjacent cavities;

first and second hollow ring-like electrically conductive straps comprising strapping tubes traversing said cavities and electrically interconnecting alternate ones of said vanes, to form a first set of alternate vanes having like polarity at the π-mode of electromagnetic oscillation of said magnetron and a second set of alternate vanes having a given different polarity at said mode of oscillation;

said vanes having windows through which said straps extend, with each strap being thermally and electrically connected to the vanes of the corresponding set;

said vanes having a generally radial orientation, with a number of radially extending coolant flow channels corresponding to the number of said strapping tubes in at least two vanes of each set for communicating a coolant fluid into and out of the interior of the corresponding strap; and

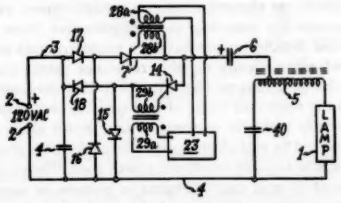
means for exciting and sustaining said electromagnetic oscillation.

4,274,033

HIGH-FREQUENCY LAMP OPERATING CIRCUIT

Joe A. Nuckolls, Hendersonville, N.C., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 350,520, Apr. 12, 1973, abandoned. This application Jun. 18, 1979, Ser. No. 49,193
Int. Cl.³ H05B *37/02, 39/04, 41/36*
U.S. Cl. 315—209 R **12 Claims**



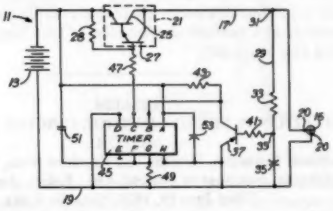
1. A high frequency starting, operating and automatic control circuit comprising, in combination, a source of current, a load connected to said source of current, impedance means connected between said load and said source of current in series therewith, first controlled semiconductor switching means connected between said source of current and said impedance means in series therewith, second controlled semiconductor switching means connected in parallel with said series-connected impedance means and said load, unidirectional current means in series with each of said controlled semiconductor switching means for directing energy pulses to said load and blocking normal source current flow, and control means including triggering means connected to said first and second controlled semiconductor switching means for alternate actuation thereof, whereby the alternate energizing of said first and second controlled semiconductor switching means applies high frequency energy pulses to said load for starting, operating and controlling the same.

4,274,034

GLOW PLUG DRIVER

Charles W. Conklin, Huntington Beach, Calif., assignor to C&D Enterprises, Huntington Beach, Calif.

Filed Oct. 15, 1979, Ser. No. 84,652
Int. Cl.³ H05B *37/00, 39/00, 41/14*
U.S. Cl. 315—240 **11 Claims**



1. A glow plug driver adapted to be coupled to a power supply and a glow plug wherein the glow plug is adapted to be placed in a fuel-air mixture where the temperature and resistance of the glow plug can vary, said glow plug driver comprising:

first and second conductive leads for coupling the glow plug to the power supply;

electronic switch means coupled to at least one of said leads and having conductive and nonconductive states whereby pulses of electrical energy can be supplied to the glow plug from the power supply when the glow plug is coupled to said leads and said electronic switch means is in said conductive state;

a conductive path coupled to the first lead to form a junction at which the voltage varies with the resistance of the glow plug when the glow plug is coupled to the first lead;

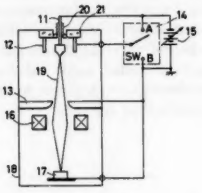
a resistor and a capacitor in said conductive path so that the capacitor can charge when the electronic switch means is in said conductive state at a rate which is a function of the voltage at said junction and discharge through said resistor when said electronic switch means is in said nonconductive state; and

control means responsive to said capacitor discharging to a predetermined level to place the electronic switch means in said conductive state, said control means including means for placing said electronic switch means in said nonconductive state whereby when the glow plug is coupled to said leads the time between the pulses supplied to the glow plug varies with the resistance of the glow plug.

4,274,035
FIELD EMISSION ELECTRON GUN

Satoru Fukuhara, Kokubunji; Hideo Todokoro, Tokyo, and Yoshio Sakitani, Saitama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 11, 1979, Ser. No. 56,527
Claims priority, application Japan, Jul. 21, 1978, 53-88407
Int. Cl.[3] G21K 7/00
U.S. Cl. 315—357 9 Claims

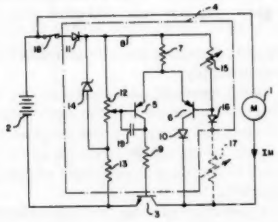


1. A field emission electron gun comprising a cathode, a control electrode disposed in the vicinity of said cathode, and anode disposed along a beam path extending from said cathode for accelerating electrons emitted from said cathode, a variable D.C. voltage source connected between said cathode and said anode, switch means connected between said voltage source and said control electrode for changing-over the potential of said control electrode between ground potential and the potential of said cathode, and means for varying the position of said cathode relative to said control electrode said anode being fixed in position relative to one of said cathode and said control electrode at a position downstream of said control electrode along said beam path.

4,274,036
ROTATIONAL SPEED CONTROL CIRCUIT FOR A D.C. MOTOR

Yoshinori Fukasaku, Hitachi, and Kunihiro Noto, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 19, 1979, Ser. No. 4,881
Claims priority, application Japan, Feb. 3, 1978, 53-10504
Int. Cl.[3] H02P 5/16
U.S. Cl. 318—331 10 Claims



1. A rotational speed control circuit for a D.C. motor comprising:

(a) a power transistor having a base, emitter and collector with its emitter-collector path connected in series with the D.C. motor and a D.C. power supply with the emitter being connected to said D.C. power supply and the collector being connected to said D.C. motor, said power transistor being controllable in response to a control signal applied to the base thereof;

(b) a differential amplifier including first and second transistors each having a base, emitter and collector, the emitters of said first and second transistors being coupled with each other, the collector of said first transistor being connected to the base of said power transistor and the collector of said second transistor being connected to the collector of said power transistor;

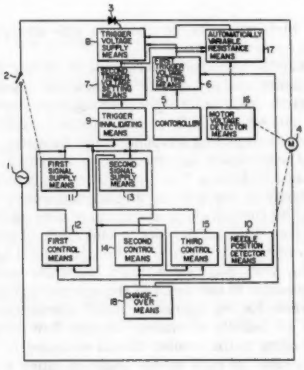
(c) a first divider circuit for dividing a voltage of said D.C. power supply to apply to the base of said first transistor, said divider circuit including means for stabilizing the base voltage of said first transistor without regard to a change in voltage across the D.C. motor; and

(d) a second divider circuit for dividing the voltage across said D.C. motor to apply to the base of said second transistor.

4,274,037
MOTOR SPEED CONTROL SYSTEM

Katsuji Soeda, Sukagawa, Japan, assignor to Yamamoto Electric Industrial Co., Ltd., Sukagawa, Japan

Filed Jun. 14, 1979, Ser. No. 48,369
Claims priority, application Japan, Jun. 16, 1978, 53-72962; Aug. 25, 1978, 53-103634
Int. Cl.[3] H02P 5/16, 3/08
U.S. Cl. 318—331 13 Claims

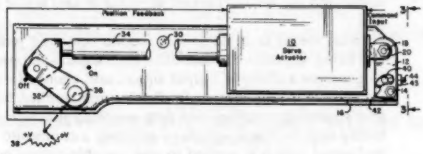


1. A speed control system for a motor comprising: a main motor circuit for supplying a motor current to the motor from an AC power supply through a main switch, a full-wave rectifier circuit and a semiconductor element with a control electrode; a variable voltage setting means connected to said full-wave rectifier circuit; a charge-discharge element impressed with a voltage set by said variable voltage setting means connected therewith; a trigger voltage supply element connected to said charge-discharge element, said trigger voltage supply element applying and releasing the charge in said charge-discharge element to said control electrode of said semiconductor element as a trigger voltage when the charge voltage of said charge-discharge element reaches a predetermined value; detector means for detecting the electromotive force of said motor, said detector means having a predetermined time constant; and automatically variable resistance means connected to said charge-discharge element and to said detector means, wherein the resistance value of said variable resistance means automatically varies in response to said motor electromotive force detected by said electromotive force detector means, said automatically variable resistance means controlling the charging current to said charge-discharge element in accordance with the resistance value thereof, the conduction phase of said semiconductor element being retarded with an increase in the motor electromotive force and advanced with a decrease in the electromotive force.

4,274,038
ELECTRICAL SERVO ACTUATOR BRACKET

Ralph V. Sawyer, Lancaster, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 28, 1980, Ser. No. 135,056
Int. Cl.³ G05B *1/06*
U.S. Cl. 318—663 **3 Claims**



1. In a bracket for mounting a linear servo actuator having a control rod which extends to rotate a crank arm through a limited angle in a direction to move an element to be controlled to an extreme position when the control rod is extended to its full control position in response to a zero input signal, said servo actuator having a position feedback potentiometer for cancelling the input signal, the combination comprising

a fixed mounting bracket,

a support arm,

means for pivotally supporting said support arm at a first fixed point on said bracket,

means for pivotally supporting said crank arm at a second fixed point on said bracket displaced from said first fixed point, said crank arm being pivotally connected to the end of said control rod remote from said actuator,

a slot in said fixed mounting bracket,

means for pivotally connecting said servo actuator to said support arm at the end thereof remote from said first fixed point, said means having a rigid extension protruding through said slot in said fixed mounting bracket,

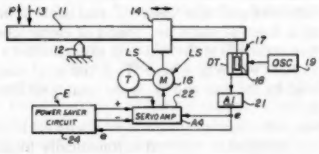
a coil spring connected between said extension through said slot and a fixed point between said first and second points, whereby said actuator and control rod are biased to move to said extreme position when said control rod is fully extended, and

limit means for limiting the extent of movement of said support arm under the force of said spring in a direction to rotate said crank arm to an extreme position when said control rod is fully extended.

4,274,039
SERVO-AMPLIFIER CIRCUIT

Gene Glassey, San Diego, and Aldan D. Gomez, El Cajon, both of Calif., assignors to Fluid Data Systems, San Diego, Calif.

Filed Feb. 25, 1980, Ser. No. 124,623
Int. Cl.³ G05B *11/01*
U.S. Cl. 318—678 **8 Claims**



1. In a servo circuit of the type having a transducer, a differential amplifier for said transducer, a second amplifier, sources of + and − DC power for said second amplifier, the voltage output of said first amplifier controlling said second amplifier and a servo motor driven from said second amplifier, the improvement which comprises:

a first resistor connected to the voltage output of said first amplifier and to a summing point,

a non-linear gain characteristic third amplifier connected to the voltage output of said first amplifier,

a second resistor of one-half the value of said first resistor connected to the output of said third amplifier and to said summing point,

a source of reference currents connected to said summing point,

a fourth amplifier receiving all of the signals at said summing point,

off-on first switch means connected to said fourth amplifier operable only the voltage output of said fourth amplifier exceeds a pre-selected threshold level,

a second switch between said source of + DC current and said second amplifier, and

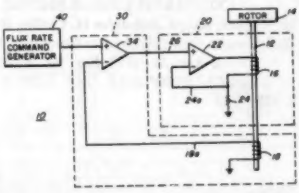
a third switch between said source of − DC current and said second amplifier,

said first switch being arranged to open both said second and said third switches only when said first switch is operable.

4,274,040
SOLENOID TORQUER SYSTEM

Leo Spiegel, Sharon, Mass., assignor to Northrop Corporation, Los Angeles, Calif.

Filed Oct. 29, 1979, Ser. No. 89,554
Int. Cl.³ G05B *17/00*
U.S. Cl. 318—689 **11 Claims**



1. A solenoid torquer system including a torquer coil and associated core, said core having a B-H hysteresis characteristic including a first peak value $+\phi_{M1}$, a second peak value $-\phi_{M2}$, a first residue value $-\Delta_1$ and a second residue value $+\Delta_2$, where ϕ_{M1}, ϕ_{M2}, Δ_1 and Δ_2 are greater than zero, Δ_1 is less than ϕ_{M1} and Δ_2 is less than ϕ_{M2}, means for generating a coil current signal representative of the current in said coil, means for generating a coil drive signal proportional to the difference between an applied coil current command signal and said coil current signal, means for applying said coil drive signal to said coil, wherein the improvement comprises:

means for generating a flux rate signal representative of the rate of change of flux in said coil, and

means for generating said coil current command signal, said coil current command signal being proportional to the difference between said flux rate signal and an applied flux rate command signal.

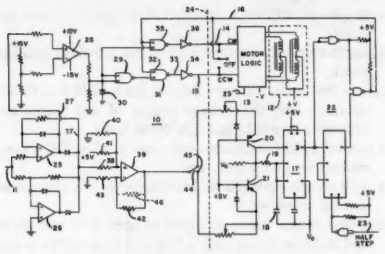
4,274,041
VOLTAGE COMMANDED STEPPING MOTOR CONTROL CIRCUIT

Edward F. Mosel, Bristol, Conn., assignor to The Superior Electric Company, Bristol, Conn.

Filed Jul. 13, 1978, Ser. No. 924,265
Int. Cl.² H02K *37/00*
U.S. Cl. 318—696 **6 Claims**

1. A voltage commanded stepping motor control circuit for having the value of a command voltage control the direction and rate of movement produced by a stepping motor in which each pulse received is translated into a step comprising terminal means connected to receive the command voltage with the voltage having a value within a range that includes a neutral

voltage, direction means connected to the terminal means for providing a signal indicative of the direction of the command voltage from the neutral value, oscillator means for producing pulses in accordance with the value of a received electrical signal, means for producing an electrical signal to the oscillator



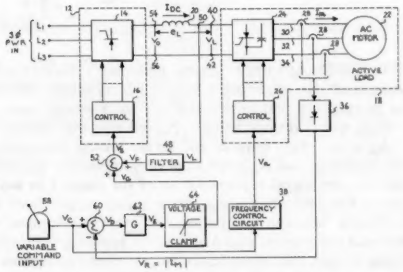
means that is related to the absolute value of the command voltage and motor logic means for receiving the pulses and the direction signal and directing the motor to produce a step in the direction dictated by the direction signal for at least every other pulse.

4,274,042

AC MOTOR DRIVE SYSTEM HAVING CLAMPED COMMAND ERROR SIGNAL

Loren H. Walker, Salem, and John H. Cutler, Roanoke, both of Va., assignors to General Electric Company, Salem, Va.

Filed Apr. 24, 1979, Ser. No. 32,893
Int. Cl.³ H02P *5/34, 7/42, 5/28, 7/36*
U.S. Cl. 318—803 **14 Claims**



1. A system for limiting the change with respect to time, of an electrical current supplied to the input of an active load from the output of a signal controlled variable output power source coupled to a main source of electrical power, comprising the combination of:

(a) an inductive reactance linking the output of said signal controlled power source to the input of said active load;

(b) first and second error signal paths respectively adapted to carry first and second error signals;

(c) circuit means, coupled to said signal controlled power source, including a first summing junction coupled to said first and second error signal paths and being operable to sum said first and second error signals and generate in accordance therewith a control signal which is applied to and operable to control said controlled power source;

wherein said first error signal path includes,

(d) circuit means coupled between said first summing junction and a circuit connection common to the inductive reactance and the input of said active load to provide a positive feedback signal to said summing junction corresponding to the signal appearing at the input of said active load, and

wherein said second signal path includes, (e) circuit means for developing a signal corresponding to the actual current supplied to said active load,

(f) means for developing a signal corresponding to a desired current to be supplied to said active load,

(g) a second summing junction coupled to the last two recited circuit means and being operable to provide a difference signal corresponding to the difference between the actual and the desired current supplied to said active load, and

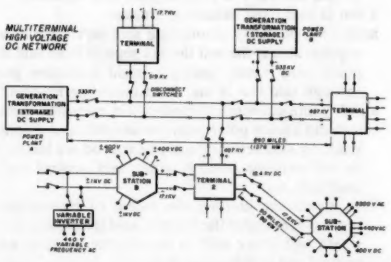
(h) circuit means coupled to said second summing junction and being responsive to said difference signal and operable to generate a clamped output signal, said clamped output signal comprising another feedback signal applied to said first summing junction, said first summing junction combining said feedback signals to generate a composite control signal which is applied to said variable output power source and being operable to limit the rate of change of current supplied to said active load for a change in the signal level of said signal corresponding to a desired current to be supplied to said active load.

4,274,043

EFFICIENT, HIGH POWER BATTERY MODULE; D.C. TRANSFORMERS AND MULTI-TERMINAL D.C. POWER NETWORKS UTILIZING SAME

Robert G. Heitz, Concord, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 21, 1978, Ser. No. 972,111
Int. Cl.³ H02J *3/36, 7/00*
U.S. Cl. 320—6 **18 Claims**



1. A high power battery module adapted for use in D.C. transformers and multiterminal D.C. power distribution systems based on such transformers, said module comprising:

(a) a battery of series-connected, rechargeable cell units, said battery having an open circuit voltage (E_{oc}) of at least 400 volts and each of said cell units consisting of a single cell or a plurality of cells in parallel and being capable of maintaining an electrical efficiency of about 95% or more while being continuously cycled for a period of at least 1000 hours, from the open circuit voltate (e_{oc}) it has when fully charged to a lesser e_{oc}, and back, at an average rate of at least 80 watts per pound of electrochemically reactive materials in the cell unit, said efficiency being defined as 100 (W_o/W_i), where W_o is the total watt-hours delivered by the unit and W_i is the total watt-hours supplied to it,

(b) an individual means associated with each of said cell units and adapted to respond automatically to development of an excessive load voltage across said cell unit by establishing a by-pass connection across it so that the series circuit through the battery is maintained,

(c) individual fuse means connected one to one in series with each of said cells,

(d) switching means operable by control signals to make or break a discharge circuit through said battery and to break

or make a charging circuit through said battery, said switching means comprising two connect/disconnect switches and a solid state load breaker, one of said switches being connected directly to one of the poles of said battery and the other switch being connected to the other pole through said load breaker,

(e) automatic monitoring means for determining the voltage across said battery and the current therethrough, the latter means being adapted to supply an output, characteristic of the magnitudes of said voltage and current, to a means for developing said control signals, when a latter such control means is connected to said monitoring means,

(f) connecting means by which said switching and monitoring means can be connected to said control means.

4,274,044

DC-DC CONVERTER FOR CHARGING A BATTERY BY MEANS OF A SOLAR CELL

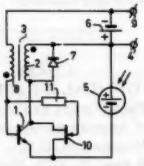
Claude Barre, Paris, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 4, 1979, Ser. No. 45,490

Claims priority, application France, Jun. 30, 1978, 78 19659

Int. Cl.[3] H02J *7/10;* **H02M** *3/335;* **H03K** *17/60*

U.S. Cl. 320—21 **7 Claims**



1. A d.c.-d.c. converter for charging a battery by means of a solar cell comprising, a transformer having a primary winding and a secondary winding, a switching transistor having a base, a collector and an emitter, a field-effect transistor having a drain, a source and a gate electrode, means connecting a first end of the primary winding of the transformer to the collector of the switching transistor and the base to a first end of said secondary winding, a resistor, means connecting said field-effect transistor drain and source electrodes directly to the collector and the emitter, respectively, of said transistor, means connecting said gate electrode to the base of the switching transistor via said resistor, and means connecting the second ends of the transformer primary and secondary windings to first and second output terminals respectively of the converter, between which output terminals the battery is adapted to be connected, and wherein the solar cell is adapted to be connected between the first output terminal and the emitter of the switching transistor.

4,274,045

POWER SUPPLY AND CONTROL CIRCUIT FOR SERIES CONNECTED CONTROLLER

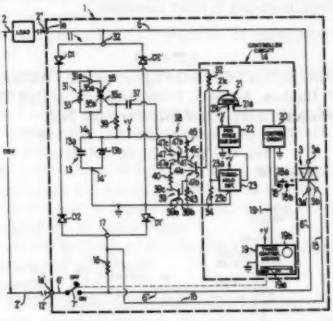
Richard Goldstein, 1671 E. Mission Hills Rd., Northbrook, Ill. 60062

Filed Apr. 9, 1979, Ser. No. 28,052

Int. Cl.[3] H05B *37/02*

U.S. Cl. 323—319 **17 Claims**

1. In a DC power supply and control circuit including a pair of AC input terminals to be connected across and energized from one AC power line and one conductor extending to one terminal of a load device whose other terminal is to be connected to another AC power line, said AC power lines being the source of an applied AC voltage to energize and operate the power supply and control circuit and load device, said power supply and control circuit further including a triggerable power conducting power switch having a pair of load terminals coupled to said AC input terminals and a control terminal for receiving a trigger signal which triggers said power switch into a conductive state which continues until current flow therethrough drops below a given holding current level during the half cycle of the applied AC voltage involved; and controller means for effecting operation of said power switch either in a non-conductive mode where the switch is continuously non-conductive or in a conductive mode where the switch is conductive repeatedly for a portion of the half cycles involved which begin after the beginning of the half cycles involved, said controller means during the conductive mode of operation of said switch generating a power switch triggering control signal fed to said control terminal of said power switch which signal causes conduction thereof a short time interval after the AC voltage applied to said power switch load terminals passes through zero; the improvement comprising a DC power supply circuit for energizing said controller means, said DC power supply circuit being coupled across said AC input terminals so that the circuit is shunted by said switch when the switch is conducting, said DC power supply circuit including energy storing means



which is coupled to said controller means to energize the same, and

a series circuit for feeding current to said energy storing means from said pair of AC input terminals, said series circuit including rectifier means for converting AC to DC and a relatively large impedance connected in series with said rectifier means and energy storing means, said impedance means being of such a greater magnitude than the impedance of said load device that only a small amount of power compared to the normal load power is drawn by said power supply circuit when said power switch is continuously non-conductive, and means operative only during the conductive mode of operation of the power switch for shunting said impedance means with a low impedance during the short intervals at the beginning of the half cycle conducting periods of the power switch when said power switch is still non-conductive so that said energy storing means is rapidly charged to permit conduction of said power switch starting at a low value of the applied AC voltage.

4,274,046

AC RESONANCE TRANSFORMER

John L. Harrison, San Diego, Calif., assignor to Maxwell Laboratories, Inc., San Diego, Calif.

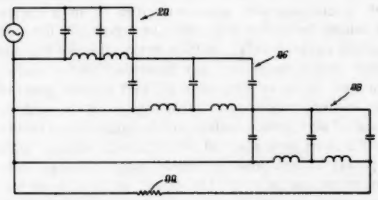
Continuation-in-part of Ser. No. 909,115, May 24, 1978, abandoned. This application Jun. 19, 1978, Ser. No. 916,781

Int. Cl.[2] G05F *3/04*

U.S. Cl. 323—355 **23 Claims**

1. An a.c. resonance transformer for operating at a predetermined frequency, comprising a first resonant stage including a first four terminal network, a second four terminal network connected to the output of said first network, and a third four terminal network connected to the output of said second net-

work, said first and said third networks each including a shunt reactor of a first type, said second network including two series connected second type reactors and a first type reactor shunt connected to the junction between said second type reactor, and means for applying said predetermined frequency to the



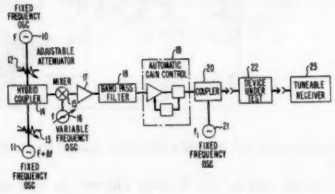
input of said first network, the reactors in said second network having values such as to provide a 180° phase shift at said predetermined frequency between the phase angle of its input and output voltage vectors and to provide a zero input impedance when its output is short circuited.

4,274,047

ANALYZER FOR NONLINEAR NETWORKS

Rudolf P. Hecken, Andover, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 7, 1979, Ser. No. 101,136
Int. Cl.³ G01R *27/00, 27/04*
U.S. Cl. 324—57 R **7 Claims**



1. Apparatus for analyzing a two-port network including an input portion having a transfer characteristic $H_A(f)$; an output portion having a transfer characteristic $H_B(f)$; and a resistive nonlinear portion therebetween;

said apparatus comprising:

means **(21)** for generating a first signal at a frequency f_1;

means **(10, 15, 16)** for generating a second signal having a variable frequency f_2;

means **(11, 15, 16)** for generating a third signal having a variable frequency $f_3 = f_2 \pm \Delta f$, where Δf is a fixed frequency difference;

means **(20)** for applying said signals to said two-port; and

means **(23)** for measuring the magnitude of the third order intermodulation distortion generated by said two-port as a function of frequency f.

4,274,048

THREE-DIMENSIONAL MEASUREMENT OF RADIANT ENERGY SCATTERING CHARACTERISTICS WITH A TURNTABLE-TYPE SCANNING INTERFEROMETER

Gus P. Tricoles, San Diego, and Eugene L. Rope, El Cajon, both of Calif., assignors to General Dynamics Corporation, Electronics Division, San Diego, Calif.

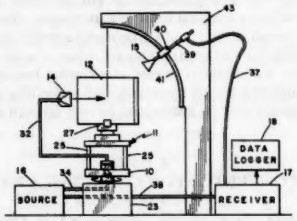
Continuation-in-part of Ser. No. 970,527, Dec. 18, 1978. This application Dec. 20, 1979, Ser. No. 105,770
Int. Cl.³ G01R *27/04*
U.S. Cl. 324—58 R **13 Claims**

1. A scanning interferometer, for enabling measurement of radiant energy scattering characteristics of a test panel, comprising

a turntable;

support means on the turntable for supporting a test panel in a selected position along the axis of the turntable;

a first antenna radially mounted to the turntable for rotation with the turntable and directed toward the selected position of a said supported test panel; and



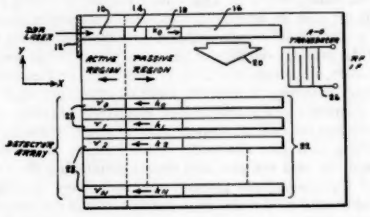
a second antenna mounted for selective positioning along a circular arc within a plane that includes the axis of the turntable, which arc extends at least ninety degrees from said axis, wherein the second antenna is radially directed toward the selected position of a said supported test panel at all positions along said arc.

4,274,049

INTEGRATED OPTICAL R-F SPECTRUM ANALYZER

Harold M. Stoll, Palos Verdes Peninsula, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 28, 1979, Ser. No. 70,454
Int. Cl.³ G01R *23/16*
U.S. Cl. 324—77 K **8 Claims**

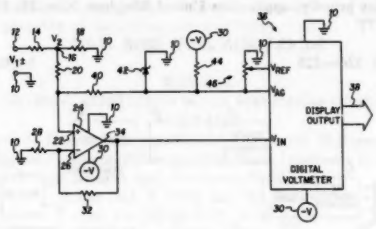


1. An integrated optical, real time R-F spectrum analyzer comprising a substrate; an active material overlying the substrate; a lasing medium located in the active material; waveguide means associated with the lasing medium for directing light generated from said lasing medium; a first distributed Bragg deflector means overlying the waveguide for directing light in the waveguide in a direction transverse to the longitudinal axis of the waveguide through said active material; a second distributed Bragg deflector matched to said first Bragg deflector for receiving light therefrom; a plurality of waveguides of preselected resonances in said substrate adjacent said second distributed Bragg deflector manifold adapted to resonate at preselected light angles; detectors connected to the waveguides of said deflector manifold producing an output signal when a waveguide resonates, and a surface acoustic wave transmitter driven by a radio frequency and transmitting a strain wave whereby light transmitted from said first distributed Bragg deflector to said second distributed Bragg deflector manifold is altered through an angle characteristic of the frequency of the input to the transmitter and one of the preselected resonances in the said plurality of waveguides.

4,274,050
VOLTAGE MEASURING APPARATUS

Thomas F. Martin, Richardson, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 13, 1979, Ser. No. 66,262
Int. Cl.[3] G01R 17/06; H03B 3/02
U.S. Cl. 324—99 D 4 Claims



1. Apparatus for measuring a bipolar potential signal using a unipolarity power supply and a normally bipolarity powered digital voltmeter (DVM) comprising, in combination:

DVM including upper potential limit terminal means, reference voltage means, measured signal input means and display output means;

apparatus reference potential means;

power supply means for supplying unipolarity power between a given polarity supply terminal and said apparatus reference potential means;

dividing means, connected between said given polarity supply terminal and said apparatus reference potential means for supplying to said upper potential limit terminal means and said reference voltage means of said DVM, signals which are intermediate in voltage the given polarity supply terminal of said power supply means and said apparatus reference potential means;

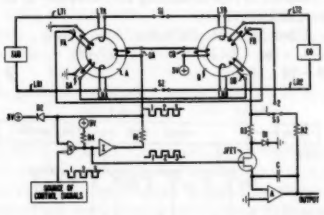
measured voltage input means; and

signal level shifting means, connected between said measured voltage input means and said measured signal input means of said DVM.

4,274,051
ELECTROMAGNETIC ARRANGEMENT FOR MEASURING ELECTRICAL CURRENT

Joseph H. Condon, Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 27, 1979, Ser. No. 61,464
Int. Cl.[3] G01R 33/00; H04M 3/22
U.S. Cl. 324—117 R 21 Claims



1. An arrangement for measuring an electrical line current flowing in a line circuit comprising:

(A) a magnetic structure having magnetic characteristics such that the slope of the hysteresis characteristic changes substantially as the magnetizing intensity H changes between a zero amount of H and a finite amount of H;

(B) means electromagnetically coupling the line circuit to the structure so that a particular amplitude and polarity of line current causes in the structure a corresponding finite amount and polarity of line H;

(C) means for supplying a succession of control signals;

(D) a control circuit controlled by each control signal so that a corresponding pulse of particular amplitude and duration and polarity electrical control current flows in the control circuit;

(E) means electromagnetically coupling the control circuit to the structure so that each control current pulse causes in the structure a corresponding change of control H where the change of control H is of a particular finite amount and of a particular polarity;

(F) each change of control H being such as to cause the magnetic induction B in the structure to undergo a corresponding change the amount and polarity of which are determined by the combined amount and polarity of line H and control H;

(G) means controlled by each control signal and by the corresponding change of B to produce a corresponding voltage pulse the amplitude and duration and polarity of which are a measure of the amount and polarity of line H in the structure;

(H) means controlled by a plurality of successive voltage pulses

(1) to perform cumulative algebraic integration of the successive voltage pulses

(2) and to provide a changing output voltage the amplitude and polarity of which are a measure of the cumulative integration;

(I) and, means controlled by the output voltage to cause in the structure an amount of feedback H where

(1) the amount of feedback H is according to the amplitude of the output voltage

(2) and the polarity of the feedback H is opposite to the polarity of any line H;

(J) whereby

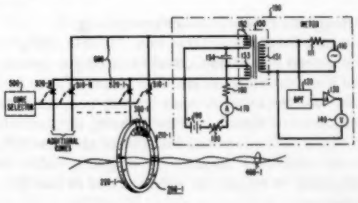
(1) the amplitude of the output voltage becomes essentially constant when in the structure the amount of feedback H essentially equals the amount of line H

(2) and the amplitude and polarity of the constant output voltage are a measure of the amplitude and polarity of the line current.

4,274,052
CURRENT METER USING CORE SATURATION

James H. Gentry, Jr., New Monmouth, and Gilbert J. Stiles, Sr., Wayside, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 13, 1979, Ser. No. 65,947
Int. Cl.[3] G01R 33/00, 1/20
U.S. Cl. 324—117 R 2 Claims



1. A current meter including a first voltage source (**110**) for providing a first frequency signal to a winding (**300-1**) enclosing a magnetic core (**200-1**), said core adapted to be coupled to the magnetic field surrounding a conductor (**400-1**),

means responsive to said first frequency signal for measuring the current through said conductor,

said measuring means including means (**120**) for detecting a harmonic of said first frequency signal, and

means for reducing said detected harmonic and characterized in that said meter further comprises means adapting

said meter for remotely measuring current through a plurality of conductors (**400-1**, . . .**400-N**),

said remote measuring means including means (**500**, **510-1**, . . .**510-N**, **520-1**, . . .**520-N**) for selecting one of said conductors,

means for extending said first frequency signal to a selected one of a plurality of windings (**300-1**, . . .**300-N**), said selected winding enclosing a selected one of a plurality of magnetic cores (**200-1**, . . .**200-N**), said selected core adapted to be coupled to the magnetic field surrounding said selected conductor, and

said harmonic reducing means including a second voltage source (**190**),

means (**150**, **600**, **160**) for extending a reference current from said second voltage source through said selected winding, and

means (**170**) for displaying the magnitude of said reference current,

means (**180**) for controlling the magnitude of said reference current, and

means (**140**) for displaying the magnitude of said harmonic whereby the magnitude of said reference current equals the magnitude of the current in said selected conductor when said harmonic is minimized.

4,274,053

MAGNETIC ROTARY ENCODER FOR DETECTION OF ABSOLUTE VALUES OF ANGULAR DISPLACEMENT

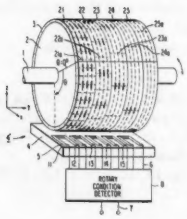
Susumu Ito, and Kaoru Toki, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 5, 1979, Ser. No. 17,770

Claims priority, application Japan, Mar. 6, 1978, 53-25818

Int. Cl.[3] **G01P** *3/48, 3/54*

U.S. Cl. 324—174 **26 Claims**



1. A magnetic rotary encoder comprising:

first means fixedly attachable to a rotatable shaft;

plural second means respectively retaining magnetic signals and being provided on said first means so as to form more than two tracks, each track having boundaries between said magnetic signals, said tracks being substantially parallel to the circumferential direction of said first means, said tracks producing respectively magnetic fields changing differently in magnitude and direction as said first means revolves;

plural ferro-magneto-resistors fixedly provided in the vicinity of the rotating paths of said tracks and responsive to said magnetic field and producing analog signals indicative of changes in their electrical resistance, said plural ferro-magneto-resistors within 45° of being parallel to said boundaries; and

a rotary condition detector electrically connected to said magneto-resistors receiving said analog signals and producing output signals indicative of the rotated angular distance of said first means in an absolute value.

4,274,054

DUAL CHANNEL APPARATUS FOR DETECTING SURFACE DEFECTS IN ELONGATE METALLIC MEMBERS WITH LIFTOFF COMPENSATION

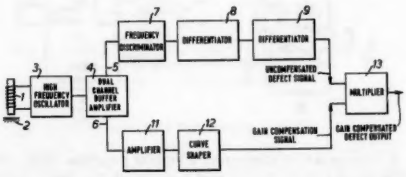
David H. Savidge, Rotherham, and Eric Wadsworth, Sheffield, both of England, assignors to British Steel Corporation, London, England

Filed Nov. 22, 1978, Ser. No. 962,945

Claims priority, application United Kingdom, Nov. 22, 1977, 48597/77

Int. Cl.[3] **G01N** *27/72;* **G01R** *33/00*

U.S. Cl. 324—225 **5 Claims**



1. Apparatus for inspecting the surface of an elongate metallic member comprising a high-frequency energised eddy-current probe for scanning over the surface of the member, said probe forming the inductive part of a tuned high-frequency oscillator circuit in which the amplitude of the voltage developed across the probe is determined by the resistive properties of the impedance of the probe, and the frequency of oscillation of said developed voltage is determined by the reactive properties of said probe impedance, a buffer amplifier connected to receive output signals from the oscillator circuit and to transmit amplified frequency-characteristic signals to one channel of a dual-channel receiver and amplified amplitude-characteristic signals to the second channel of said dual-channel receiver, a frequency discriminator in circuit in said one channel connected to receive said frequency-characteristic signals and to transmit demodulated signals to a first input of a multiplier, a curve shaper in circuit in said second channel of said dual-channel receiver and connected to receive said amplitude-characteristic signals and to transmit gain-compensated signals to a second input of said multiplier, said input signals being processed within said multiplier to provide output signals representative of the surface condition of the member under inspection compensated for changes in sensitivity resulting from changes in the probe spacing during scanning.

4,274,055

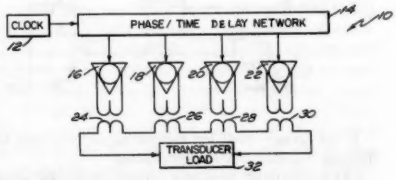
SYNTHESIZED SINUSOID GENERATOR

Gerald L. Assard, Waterford, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 16, 1979, Ser. No. 20,902

Int. Cl.[3] **H03B** *19/00, 27/00*

U.S. Cl. 328—14 **8 Claims**



1. A sinusoid generator for synthesizing a sinusoidal signal of a specified tonal purity which comprises:

a clock for generating pulses of a preselected frequency as output thereof;

a phase/time delay network receiving an input thereof from the output of said clock;

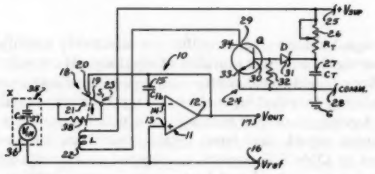
a first plurality of equal gain switching amplifiers receiving inputs thereof from the output of said phase/time delay network sequentially as a function of the time period of said pulses of said clock and having means for providing equal amplitude output signals in response to the input signals; and

a transducer load being coupled to the outputs of said first plurality of switching gain amplifiers.

4,274,056
CHARGE AMPLIFIER WITH MINIMUM OFFSET VOLTAGE

Henry J. Lukes, Bellevue; Walter Kamphorst, Redmond, and Romeal F. Asmar, Bellevue, all of Wash., assignors to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Nov. 8, 1978, Ser. No. 958,685
Int. Cl.³ H03F *3/70, 3/72, 1/08*
U.S. Cl. 328—162 **18 Claims**



1. In a charge amplifier circuit including a charge amplifier, a transducer connected to a source of reference voltage, and a feedback capacitor connected between an inverting input terminal and output terminal of the amplifier, the improvement comprising:

double-throw break-before-make switch means alternatively (a) connected across said capacitor shorting the capacitor and concurrently disconnecting said transducer from said inverting input terminal, and (b) connecting said transducer to said inverting input terminal and concurrently discontinuing shorting of the capacitor; and

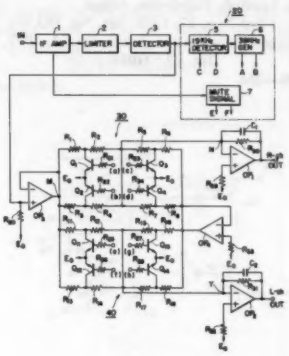
resetting circuit means for selectively operating said switch means to first disconnect the switch means from across the capacitor and subsequently effect connection of the transducer to the inverting input terminal whereby said capacitor is charge-free at the time the switch means connects the transducer to said inverting input terminal.

4,274,057
MPX STEREOPHONIC DEMODULATION

Kohji Ishida, and Tatsuo Numata, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jul. 2, 1979, Ser. No. 54,116
Claims priority, application Japan, Jun. 30, 1978, 53-80010
Int. Cl.³ G01P *3/48, 3/54*
U.S. Cl. 329—167 **13 Claims**

1. An MPX stereophonic demodulation circuit comprising: first and second switching circuits to transmit a composite input signal to respective output terminals; a reference voltage line; each of said switching circuits having (i) first and second transmission paths and (ii) first and second switching elements connected respectively between points on said transmission paths and said reference voltage line; a voltage follower circuit; each of said switching circuits further comprising (i) first and second parallel resistor paths between said voltage follower circuit and one of said output terminals and (ii) third and fourth switching elements connected respectively between points on said resistor paths and said reference voltage line; and means to render opposite pairs of switching elements in said two switching circuits to be conductive at the same time

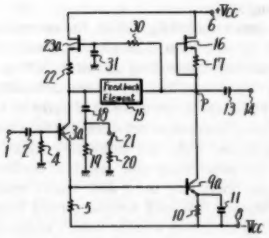


whereby said composite input signal is demodulated at said output terminals.

4,274,058
AMPLIFIER WITH SEPARATE AC AND DC FEEDBACK LOOPS

Tadao Suzuki, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 16, 1979, Ser. No. 30,388
Claims priority, application Japan, Apr. 18, 1978, 53/45618
Int. Cl.³ H03F *3/45*
U.S. Cl. 330—253 **11 Claims**



1. An amplifier with separate AC and DC feedback loops comprising:

(a) a DC voltage source having first and second output terminals;

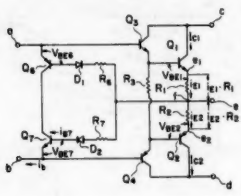
(b) first and second transistors differentially connected between said first and second output terminals of said DC voltage source and each having first, second and third electrodes, the first electrode of said first transistor being supplied with an input signal to be amplified, the second electrodes of said first and second transistors being connected to each other, the third electrode of said first transistor being connected to one of the first and second output terminals of said DC voltage source through a first load;

(c) a third transistor having first, second and third electrodes, the first electrode of said third transistor being DC-coupled to the third electrode of said first transistor, the second electrode of said third transistor being connected to said one output terminal of said DC voltage source, and the third electrode of said third transistor being connected to the other output terminal of said DC voltage source through a constant current source means.

4,274,059
SINGLE ENDED PUSH-PULL AMPLIFIER

Yasuhisa Okabe, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Nov. 27, 1978, Ser. No. 963,901
Claims priority, application Japan, Dec. 1, 1977, 52/144257
Int. Cl.[3] H03F 3/30
U.S. Cl. 330—266 8 Claims



1. A single ended push-pull amplifier responsive to a preamplifier of a Class A amplifier so that current flows to the push-pull amplifier from the preamplifier even when no signal is applied to the preamplifier output signal comprising:

(a) first and second transistor-amplifying stages for respectively amplifying each half cycle of the output signal of the preamplifier, said first and second stages forming a final stage of a single ended push-pull arrangement;

(b) first and second resistors respectively interposed in the collector-emitter paths of said first and second transistor-amplifying stages;

(c) a base bias controlling circuit for controlling base bias voltages of said first and second transistor-amplifying stages, said bias controlling circuit including two complementary transistors having series connected collector-emitter paths, the series connected paths of said two transistors being interposed between the base circuits of said first and second transistor amplifying stages; and

(d) means for controlling said base bias controlling circuit, said means including third and fourth resistors respectively forming first and second closed loops, said first closed loop including a series circuit comprising:

(a) said first resistor,

(b) the base circuit of said first transistor-amplifying stage,

(c) the base-emitter path of one of said two complementary transistors and said third resistor,

so that the amount of electric current flowing through said third resistor varies in accordance with the current flowing through said first resistor, and all of the current flowing through the base of said transistor included in said first closed loop flows through said third resistor, said second closed loop including a series circuit comprising:

(a) said second resistor,

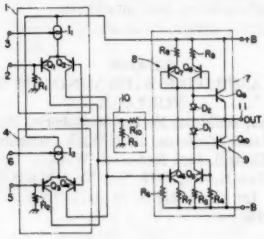
(b) the base circuit of said second transistor-amplifying stage,

(c) the base-emitter path of the other of said two complementary transistors and said fourth resistor, so that the amount of electric current flowing through said fourth resistor varies in accordance with the current flowing through said second resistor, and all of the current flowing through the base of said transistor included in said second closed loop flows through said fourth resistor, said first closed loop being responsive to said input signal, said second closed loop being connected to a load of said input signal.

4,274,060
SIGNAL CHANGE-OVER AMPLIFIER

Yoshihiro Kawanabe, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Nov. 13, 1979, Ser. No. 93,561
Claims priority, application Japan, Nov. 15, 1978, 53/156836[U]
Int. Cl.[3] H03F 3/68, 3/45
U.S. Cl. 330—295 4 Claims



1. A signal change-over amplifier for selectively amplifying one input signal among a plurality of input signals comprising: a plurality of input signal control sections, each of said control sections being provided for each of said input signals; an output section having an output terminal to which is coupled a selected input signal, said input signal control sections being subjected to ON-OFF control in response to corresponding control signals, each of said input signal control sections including a first transistor having an emitter, a base and a collector, the base of said first transistor being coupled to receive one of said input signals; a second transistor having an emitter, a base and a collector, the emitter of said second transistor being commonly connected to the emitter of said first transistor so that said first and said second transistors are coupled in a differential circuit; a constant current source connected to supply current to the commonly connected emitters of said first and said second transistors, said constant current source being activatable in response to the corresponding control signal; said collectors and bases of said second transistor and said collector of said first transistor of each of said control input sections being respectively interconnected; and said output section including third and fourth transistors each having a base and a collector, the bases of said third and fourth transistors being respectively connected to the collectors of said first and said second transistors of said control sections; current producing means having input and output terminals respectively connected to the collectors of said fourth and said third transistors; and a push-pull circuit connected to the output terminal of said current producing means.

4,274,061
REFERENCE VOLTAGE SOURCE, IN PARTICULAR FOR AMPLIFIER CIRCUITS

Horst Kraemer, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 10, 1979, Ser. No. 83,249
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1978, 2850826
Int. Cl.[3] H03F 3/04, 3/45
U.S. Cl. 330—296 5 Claims

1. A reference voltage source comprising:

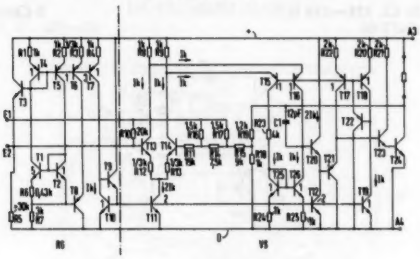
first and second transistors each including a base, an emitter and a collector, said base of said second transistor connected to its collector and to said base of said first transistor;

a reference potential terminal and an operating voltage terminal;

first and second resistors connected in series between said

emitter of said first transistor and said reference potential and including a junction therebetween connected to said emitter of said second transistor;

a current mirror circuit connected between said operating voltage terminal and said collectors of said first and second transistors, said current mirror circuit comprising a third transistor including an emitter-collector circuit connected to said operating voltage terminal; and



a fourth transistor including an emitter-collector circuit connected in series with said emitter-collector circuit of said third transistor, and forming a tap therebetween, and connected to said reference voltage terminal, and a base connected to said emitter of said second transistor,

said tap providing an output reference voltage for a circuit supplied by the reference voltage source.

4,274,062

DYESTUFF LASER

Uwe Brinkmann; Helmut Telle, both of Cologne; Roderich Raue, Leverkusen, and Carl-Wolfgang Schellhammer, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

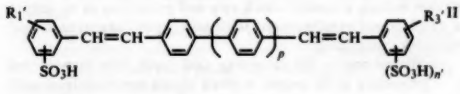
Filed Jan. 3, 1978, Ser. No. 866,522

Claims priority, application Fed. Rep. of Germany, Jan. 5, 1977, 2700292

Int. Cl.[2] **H01S** *3/20*

U.S. Cl. 331—94.5 L **6 Claims**

1. Dyestuff laser consisting of a reservoir, with a laser dyestuff solution contained therein, and a pump light source connected thereto, which is capable of exciting the dyestuff solution to produce an emission, characterised in that the dyestuff solution contains a dyestuff which, in the form of the free acid corresponds to the formula



wherein

R_1' and R_3' independently of one another represent hydrogen, methyl or chlorine and

n' and p each represent 1,

in a solvent which does not interfere with the emission, at a concentration, which emits laser beams, of, preferably, 10^{-2} to 10^{-5} mols/liter.

4,274,063

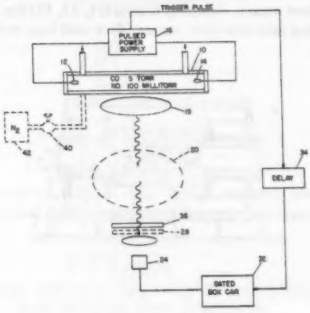
INFRARED SPECTROSCOPIC LAMPS AND GAS DETECTORS INCORPORATING SUCH LAMPS

Ali Javan, 12 Hawthorn St., Cambridge, Mass. 02138

Continuation-in-part of Ser. No. 755,463, Dec. 30, 1976, abandoned. This application Apr. 24, 1978, Ser. No. 899,573

Int. Cl.[3] **H01S** *3/22*

U.S. Cl. 331—94.5 R **15 Claims**



1. An enhanced emission spectroscopic lamp for trace gas detection of a given molecular gas, said lamp adapted to produce spectral radiation at selected spontaneous emission frequencies in the infrared corresponding to an absorbing molecular rotation-vibration transition band of said given gas, said lamp comprising means defining a gas discharge chamber, excitation means for creating a gaseous discharge within said chamber, a gas mixture within said chamber providing both an excitable buffer gas and a quantity of said given gas, and radiation transmissive means for transmitting emissions from said given gas in said chamber to a point of utilization located outside of said chamber, said buffer gas having a first state excitable by said excitation means and matched to said given gas in the manner that energy from said state of said buffer gas can transfer via collisions to said given gas an excite the upper levels of said absorbing transition band, whereby resultant radiative decay of said upper levels to the lower levels of said absorbing transition band produces the desired selected spontaneous emissions from said given gas enhanced by said buffer gas, said gas mixture having the characteristic, in response to said excitation means, of producing undesired other spontaneous emissions as a result of excitation of other levels whose decay time is short relative to the period of said desired emission of said given gas, said lamp combined with means periodically to interrupt said excitation means, and delay means adapted to delay the transmission of emission from the lamp to said point of utilization for a period of time following de-energization of said excitation means to a second period when said other levels whose decay time is relatively short are decayed and said given gas continues to emit at the desired transition.

4,274,064

APPARATUS FOR MECHANICALLY DECOUPLING A RESONATOR OF A GAS DYNAMIC LASER

Gunther Sepp, Ottobrunn; Gunthard Born, Taufkirchen, and Werner Malburg, Neubiberg, all of Fed. Rep. of Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 6, 1978, Ser. No. 922,210

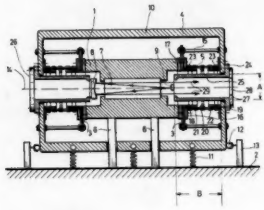
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1977, 2731346

Int. Cl.[3] **H01S** *3/02*

U.S. Cl. 331—94.5 G **5 Claims**

1. An apparatus for mechanically decoupling the resonator means (4) for resonating the laser vibration in a gas dynamic laser from other components of said gas dynamic laser, com-

prising laser medium flow channel means (7) for flowing a laser medium therethrough, said laser medium flow channel means having a longitudinal axis as well as first and second open ends, elastic sealing means (5) operatively connected to said resonator means (4) and to said first and second open ends of said flow channel means (7) for sealing said flow channel means from said resonator means in a vacuum tight manner, base means (2) for operatively supporting said resonator means, support means (6) for rigidly securing said flow channel means to said base means, damping means (11, 12, 13) for operatively connecting said resonator means (4) to said base means (2), and



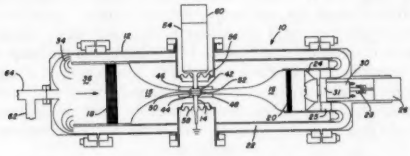
securing means (15, 3) including ring disk membrane means (3) for operatively securing said first and second open ends of said flow channel means (7) to said resonator means (4), said ring disk membrane means (3) having a given first spring stiffness for applying a damping and restoring action to said resonator means, said elastic sealing means (5) and said damping means (11, 12, 13) having a second given spring stiffness smaller than said given first spring stiffness of said ring disk membrane means (3), whereby the sealing action of said elastic sealing means (5) is substantially independent of said damping and restoring action of said ring disk membrane means (3).

4,274,065

CLOSED CYCLE ANNULAR-RETURN GAS FLOW ELECTRICAL DISCHARGE LASER

Alan Garscadden, Yellow Springs; Peter Bletzinger, Fairborn; Siegfried H. Hasinger; Robert A. Olson, both of Kettering, and Benjamin Sarka, Enon, all of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 31, 1979, Ser. No. 62,591
Int. Cl.³ H01S *3/03*
U.S. Cl. 331—94.5 G **4 Claims**



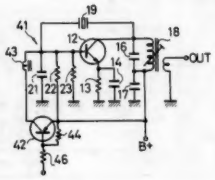
1. An electrical discharge laser, comprising: a hermetically sealed envelope; a laser flow channel within said envelope; a gas mixture in said laser flow channel; means for providing a high velocity uniform flow of said gas mixture through said laser flow channel; means for producing an electric discharge in said gas mixture; and an optical resonant cavity having a optical axis perpendicular to said laser flow channel; said optical resonant cavity having laser mirror means for directing the optical axis through said electric discharge and removing optical energy generated by said electric discharge in said gas mixture; said means for providing a high velocity uniform flow of gas mixture through the laser flow channel including means for providing an annular gas flow return path surrounding the laser flow channel.

4,274,066

QUARTZ CRYSTAL OSCILLATOR

Akiyuki Yoshisato, and Katsumi Tobita, both of Soma, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Division of Ser. No. 958,246, Nov. 6, 1978, which is a continuation of Ser. No. 805,860, Jun. 13, 1977, abandoned. This application Oct. 22, 1979, Ser. No. 86,807
Claims priority, application Japan, Jun. 18, 1976, 51-79913
Int. Cl.³ H03B *5/36*
U.S. Cl. 331—116 R **5 Claims**



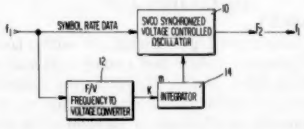
1. A crystal oscillator comprising:
a resonant circuit including a crystal;
an active element comprised by a first transistor connected to said resonant circuit for applying a driving excitation to said resonant circuit;
feedback means connected between said resonant circuit and said active element for applying a feedback signal from said resonant circuit to said active element;
switch means including a switching transistor for increasing the bias voltage applied to said first transistor above a normal value for a predetermined length of time after initial energization of the oscillator; and
a bias resistor for applying a bias voltage to said first transistor, the switching transistor being connected across the bias resistor in such a manner as to short out the bias resistor when switched on for the predetermined length of time.

4,274,067

UNIVERSAL CLOCK RECOVERY NETWORK FOR QPSK MODEMS

Vasil Uzunoglu, Ellicot City, Md., assignor to Communications Satellite Corporation, Washington, D.C.

Filed Sep. 27, 1979, Ser. No. 79,653
Int. Cl.³ H03K *3/282*; H03L *7/24*
U.S. Cl. 331—172 **10 Claims**



1. A clock recovery network for receiving an input data stream having a symbol clock rate and providing as an output a clock signal synchronized with said input data stream, said network comprising:
oscillator means for receiving said input data stream and providing at its output a clock signal synchronized with said input data stream, said oscillator means being synchronized to said input data stream by means of synchronizing pulses generated from said input data stream, the free-running frequency of said oscillator means in the absence of said synchronizing pulses being determined by a coarse control voltage; and
coarse control voltage generating means for generating and providing to said oscillator means a coarse control voltage

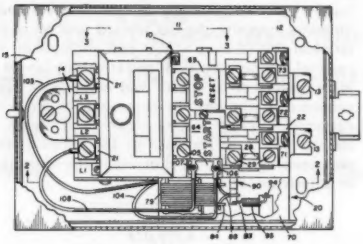
corresponding to a desired output frequency of said clock recovery network.

4,274,068

UNDERVOLTAGE PROTECTOR FOR MANUAL MOTOR CONTROLLER

Carl Thompson, Jr., Westminster, Md., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Jun. 26, 1979, Ser. No. 52,289
Int. Cl.³ H01H *73/06*
U.S. Cl. 335—20 **10 Claims**



1. Electrical switching apparatus including a controller and a trip unit for automatically opening said controller when operating voltage applied to the latter falls below a predetermined level; said controller including cooperating contact means, an operating mechanism for selectively opening and closing said contact means, automatic trip means which when actuated by detecting the occurrence of predetermined fault current conditions releases said mechanism whereby the latter opens said contact means; said trip unit comprising an electromagnet having an armature mounted for movement between first and second positions, an operating coil which when energized at a predetermined level by voltage applied to said controller generates magnetic flux in said armature which holds the latter in said first position, biasing means urging said armature toward said second position, means operatively engaging said armature with said automatic trip means for actuating the latter while said armature is being moved by said biasing means from said first to said second position, with said armature resting generally at said second position said biasing means being ineffective to prevent automatic resetting of said trip means when said operating voltage again rises above approximately said predetermined level.

4,274,069

LOCKING ARRANGEMENT FOR ELECTRIC CIRCUIT BREAKERS

Werner Troebel, and Klaus-Dieter Habedank, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich & Berlin, Fed. Rep. of Germany

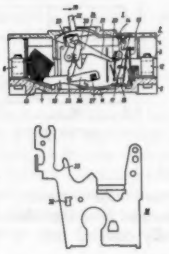
Filed Mar. 6, 1979, Ser. No. 17,919
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1978, 2810233
Int. Cl.³ H01H *73/02, 75/00*
U.S. Cl. 335—21 **4 Claims**

1. In a locking arrangement for electric circuit breakers including:

(a) a locking strap rotatably or tiltable supported, by means of two pivots lying on a common ideal axis, in support openings in stationary parts, the cross section of the pivots being rectangular; and

(b) a latch held, in the closed position of the circuit breaker, against a biasing force by said locking strap, said biasing force applied to said locking strap by said latch in such a manner that one of the small surfaces of the pivots is acted upon by said biasing force the improvement comprising:

(c) the support openings having a convex surface along a short surface thereof and a further convex surfaces along two opposed long surface thereof and the one small surface of each pivot being disposed opposite said convex surface of the corresponding support opening and the long



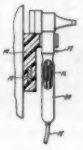
surfaces of each pivot each being disposed, with play, opposite said further convex surface of the support opening.

4,274,070

PROXIMITY INSTANT-ON SWITCH FOR MEDICAL AND DENTAL INSTRUMENTS

Paul G. Thiene, Laguna, Calif., assignor to Surgical Mechanical Research Corp., St. Louis, Mo.

Filed Aug. 14, 1979, Ser. No. 66,507
Int. Cl.³ H01H *9/00*
U.S. Cl. 335—205 **2 Claims**



1. A proximity instant-on switch for an electrical medical or dental instrument that is adapted to seat in a holder disposed on a medical or dental unit, comprising magnetic switching means including a permanent magnet embedded in said holder and a magnetically-responsive switch member electrically connected to the instrument load and disposed in the handle of the instrument such that when the instrument is placed in said holder the instrument is de-energized by said magnetic switching means and when the instrument is removed from said holder the instrument is automatically energized by said magnetic switching means.

4,274,071

THREE-PHASE FERRORESONANT TRANSFORMER STRUCTURE EMBODIED IN ONE UNITARY TRANSFORMER CONSTRUCTION

Edgar L. Pfarre, Madison, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 16, 1979, Ser. No. 95,094
Int. Cl.³ H01F *33/00, 27/24*
U.S. Cl. 336—12 **8 Claims**

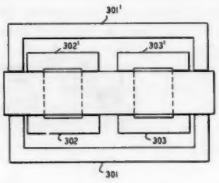
1. A three-phase ferroresonant transformer structure comprising;

a first and second closed flux path positioned adjacent each other and encircling a first and second window;

a third closed flux path encircling said first and second closed flux paths;

first and second magnetic shunts joining opposite portions of the first and second closed flux paths and bridging the first and second windows; respectively

a third magnetic shunt joining opposite portions of the third closed flux path and bridging the first and second windows; and



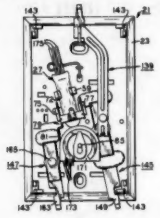
said first, second and third magnetic shunts each being independent and isolated from the other two magnetic shunts and magnetically coupled only to its related magnetic shunt path.

4,274,072

THERMOSTAT AND ASSEMBLY THEREFOR

Ralph W. Gustafson, Morrison, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed Oct. 25, 1977, Ser. No. 845,383
Int. Cl.³ H01H *71/16*
U.S. Cl. 337—75 **50 Claims**



1. A thermostat adapted for effecting regulation of the temperature of a space in which the thermostat may be located, the thermostat comprising:

a casing including a base;

a post rotatably mounted to said base;

bimetal means adapted for movement to adjusted positions and movable in respective ones of the adjusted positions for sensing the temperature of the space, said bimetal means having a generally spiral configuration with generally radially spaced inner and outer ends and said inner end being secured to said post so as to be conjointly rotatable therewith;

a temperature selector manually movable with respect to said casing within a predetermined range of temperature settings so as to set a preselected temperature for the space and operably connected with said post to conjointly rotate said post and said bimetal means to a respective one of the adjusted positions of said bimetal means correlative with the preselected temperature set by said temperature selector upon the manual movement thereof;

a switch device including a pair of spaced apart terminals, a first pair of contacts mounted in opposed relation on said terminal pair, a third terminal disposed between said terminal pair and including a movable armature, a second pair of contacts mounted to said armature for making engagement with and breaking disengagement from said first contact pair, and means for encapsulating said switch device with parts of said terminal pair and said third terminal disposed exteriorly of said encapsulating means so as to define circuit connection sections, respectively;

means secured to said base and embracing at least in part said encapsulating means for mounting said switch device in a predetermined position with respect to said post;

a bracket associated with said bimetal means so as to be conjointly movable therewith and including a pair of arms disposed generally adjacent said encapsulating means and on opposite sides of said terminal pair therein, respectively, means extending generally across said encapsulating means for integrally interconnecting said arm pair, and means on said bracket for securing engagement with said outer end of said bimetal means; and

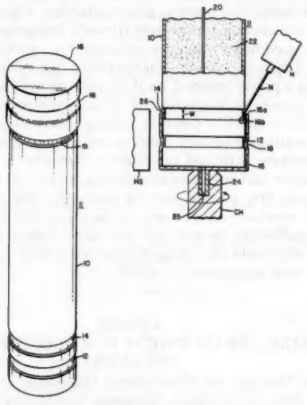
a pair of magnet means mounted on said arm pair and adapted for magnetic coupling relation with said armature, respectively, said magnet means pair being conjointly movable generally in one direction and another direction opposite thereto toward and away from said terminal pair so as to attract said armature in one of the one and another directions and effect the circuit completing engagement of one of said contacts of said second contact pair with one of said contacts of said first contact pair upon the conjoint movement of said bracket with said bimetal means in response to the temperature sensing movement of said bimetal means in the respective one of its adjusted positions.

4,274,073

SUBMERSIBLE FUSE

Russell M. Luck, Monroeville, and Gordon C. Gainer, Penn Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 30, 1976, Ser. No. 755,772
Int. Cl.³ H01H *85/14, 85/16*
U.S. Cl. 337—248 **4 Claims**



1. An oil submersible fuse, comprising:

(a) hollow elongated insulating tubular barrel means having a continuous annular groove in the outer surface thereof, said groove being longitudinally disposed proximate to one end of said barrel means;

(b) first ferrule means securely and directly disposed upon said one end of said barrel means to enclose said barrel means at said one end thereof, said first ferrule means terminating in an opened end which is characterized by a circumferential ferrule edge, said first ferrule means having a circumferentially continuous inner surface portion which is longitudinally contiguous with said edge, said edge and said inner surface portion of said first ferrule means longitudinally aligning with only a longitudinal measured portion of said groove;

(c) second ferrule means securely disposed upon the other end of said barrel means to enclose said barrel means at said other end;

(d) fusible means disposed within said hollow barrel means in a disposition of electrical contact with said first ferrule means and said second ferrule means for being fused at an appropriate electrical condition; and

(e) flexible sealing material disposed in said annular groove in a condition of adhesion with said barrel means and said inner surface portion of said first ferrule means to seal the internal portion of said enclosed barrel means from the oil of an oil bath in which said barrel means is disposed, said sealing material being effective as an oil resistant adhesive seal in a temperature range from −40° C. to +150° C.

4,274,074

SLIDE TYPE VARIABLE RESISTOR HAVING DUAL TRACKS

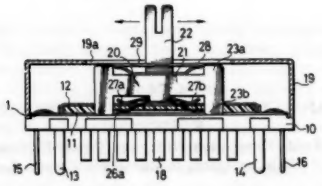
Nozomu Sakamoto, Tokyo, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Jun. 8, 1979, Ser. No. 47,344

Claims priority, application Japan, Sep. 6, 1978, 53-78764[U]

Int. Cl.³ H01C *10/30*

U.S. Cl. 338—160 **8 Claims**



1. A variable resistance apparatus of slide type comprising:

a housing;

an insulating base plate secured in said housing;

first and second resistor units provided on said insulating base plate, each of said first and second resistor units including a resistor member having conductive portions connected to the opposite ends thereof and including a plurality of conductive taps extending transversely from said resistor member, said conductive taps being arranged in parallel with respect to one another;

a central isolation band provided between said first and second resistor units;

an elongated bridge member consisting of insulating material and being provided above said first and second resistor units;

first and second conductive bands provided on said bridge member, said conductive bands being insulated from and arranged in parallel with respect to each other; and

a slider holder movably mounted in said housing and holding first and second sliders, said first and second sliders being adapted to slidingly contact with the conductive portions and the conductive taps in said first and second resistor units, respectively, and with the corresponding conductive bands on said bridge member.

4,274,075

ELECTRONIC MULTI-RANGE VARIABLE RESISTOR

Helmut Schleicher, Berlin, Fed. Rep. of Germany, assignor to Schleicher GmbH & Co. Relais-Werke KG, Fed. Rep. of Germany

Continuation of Ser. No. 821,806, Aug. 4, 1977, abandoned. This application Jun. 18, 1979, Ser. No. 49,339

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1976, 7636488[U]

Int. Cl.³ H01H *19/18*

U.S. Cl. 338—172 **5 Claims**

1. An electronic multi-range resistor with a variable adjustment for the selection of resistances within each range comprising:

a housing including a front end;

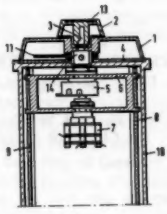
a frontal plate enclosing the front end;

a scale located on the frontal plate;

a bridge support disposed in the housing comprising a pair of spaced plates spaced from the frontal plate with central apertures formed in the plates aligned with apertures in the center of the scale and frontal plate, the apertures being concentric to each other;

a hollow shaft potentiometer located between the bridge plates and mounted to the one bridge plate nearest the frontal opening, with the hollow shaft projecting through the apertures for variable resistance selection;

a turning knob including a transparent upper frontal section spaced from and overlapping the scale, said turning knob



further including a slip proof, rippled, and slanted peripheral area substantially enclosing the scale and engaging the frontal plate, the turning knob attached to the hollow shaft for rotation therewith;

a pointer attached to the hollow shaft for rotation therewith and continuously movable across the scale;

a selection switch with individual fixed resistors affixed to the other bridge plate defining a plurality of ranges of resistance;

a shaft of the selection switch passing centrally through the hollow shaft and protruding through the turning knob; and

a knob radially smaller than the turning knob, and concentrically disposed therewith, said knob attached to an end of the selection switch shaft for the selection of certain of the fixed resistors.

4,274,076

DEVICE FOR DETERMINING THE MOMENT WHEN COMPETITORS IN A RACE ARE PASSING THE FINISH LINE

Winfried Hermanns, Lutticherstr. 181, D-5100, Aachen, Fed. Rep. of Germany; Heinz Lueg, Aachen, Fed. Rep. of Germany; Hanno Blackert, Aachen, Fed. Rep. of Germany, and Dirk Wimmenauer, Aachen, Fed. Rep. of Germany, assignors to Winfried Hermanns, Aachen, Fed. Rep. of Germany

Filed Mar. 25, 1980, Ser. No. 133,839

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1979, 2914114

Int. Cl.³ G08C *21/00*

U.S. Cl. 340—38 L **8 Claims**

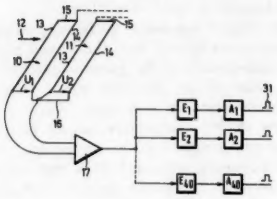
1. A system for determining the moment when competitors in a race pass the finish line, in which race the competitors are each fitted with a transmitter, said system comprising:

at least two receiving antennae arranged at the finish line, the signals from said antennae being combined and supplied to an evaluating equipment comprising:

means for coupling said signals from said antennae in opposite sense to form a difference signal therebetween,

a rectifier receiving said difference signal, and

an output signal circuit connected to said rectifier and responsive to a voltage change of the rectified differ-



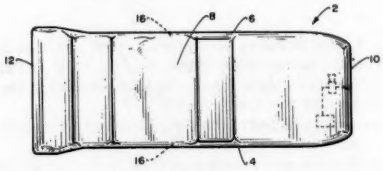
ence signal for generating a system output signal indicating that a competitor has passed the finish line.

4,274,077

VEHICLE COVER AND ALARM SYSTEM THEREFOR

Jerrold C. Feiger, 11820 Mayfield Ave., Los Angeles, Calif. 90049

Filed Nov. 26, 1979, Ser. No. 97,344
Int. Cl.³ B60R *25/10*
U.S. Cl. 340—63 **11 Claims**



1. An anti-tamper device for vehicles and the like comprising the combination: a conformable material cover having depending side panels to enshroud at least the major body portion of a vehicle; at least one sensor removably secured to each of said side panels and adapted to energize and de-energize an electrical circuit upon movement of said cover; electrical connector means connecting said sensors with an alarm system adapted to produce an alarm signal whereby in the normal covered state said sensors are in the non-energizing position and otherwise are in the energizing position to energize said alarm system to generate an alarm signal.

4,274,078

MIRROR ASSEMBLY WITH INDICATOR

Takayuki Isobe, Yokohama, and Mikio Matsuzaki, Isehara, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama and Ichiko Industries Limited, Tokyo, both of, Japan

Filed May 22, 1979, Ser. No. 41,335
Claims priority, application Japan, May 22, 1978, 53-67725
Int. Cl.³ G02B *5/08*
U.S. Cl. 340—98 **4 Claims**

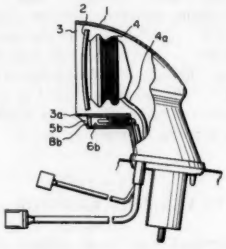
1. In a vehicle equipped with various condition indicating devices, a rear vision mirror assembly comprising:

a housing including a cowl portion having an opening;

a mirror disposed within said cowl portion and adapted to be observed through said opening;

means adjacent the mirror in said housing defining a plurality of containers each of which receive illuminable indicator means therein, said containers being sequestered with respect to the level of said opening so as to be shaded by said cowl portion; and

means for interconnecting said illuminable indicator means with means for monitoring said various devices of said vehicle and for selectively illuminating said illuminable



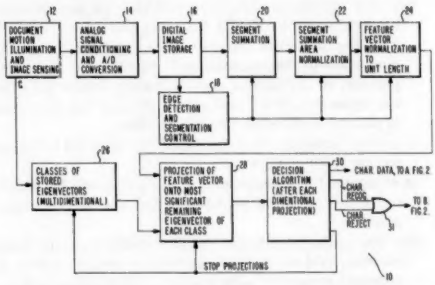
indicator means in response to the operation of said various devices.

4,274,079

APPARATUS AND METHOD FOR DYNAMIC FONT SWITCHING

Robert Todd, Farmington Hills, and Frank J. Haas, Livonia, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jul. 12, 1979, Ser. No. 57,070
Int. Cl.³ G06K *9/70*
U.S. Cl. 340—146.3 FT **8 Claims**


DOCUMENT MOTION ILLUMINATION AND IMAGE SENSING
ANALOG SIGNAL CONDITIONING AND A/D CONVERSION
DIGITAL IMAGE STORAGE
SEGMENT SUMMATION
SEGMENT SUMMATION AREA NORMALIZATION
FEATURE VECTOR NORMALIZATION TO UNIT LENGTH
EDGE DETECTION AND SEGMENTATION CONTROL
CLASSES OF STORED EIGENVECTORS (MULTIDIMENTIONAL)
PROJECTION OF FEATURE VECTOR ONTO MOST SIGNIFICANT REMAINING EIGENVECTOR OF EACH CLASS
DECISION ALGORITHM (AFTER EACH DIMENTIONAL PROJECTION)
CHAR. DATA, TO A FIG. 2
CHAR. RECOG.
CHAR. REJECT
TO B FIG. 2
STOP PROJECTIONS

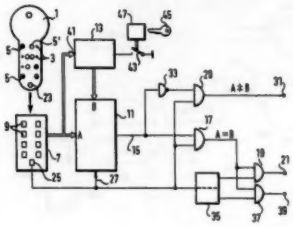
1. An apparatus for recognizing a presented pattern as being in one of a plurality of predetermined classes of patterns, having generating means for generating a predetermined combination of signals representing the geometric configuration of the presented pattern, said predetermined combination of signals defining a feature vector of the presented pattern, projecting means for projecting said feature vector onto one of a plurality of sets of predetermined multi-dimensional subspaces, each of said sets characterizing a specific predetermined class of patterns, selector means for selecting one of said patterns as the presented character according to a predetermined algorithm employing the results of said projections prior to said entire projection process being completed wherein the improvement comprises:

switching means operative to sense said presented pattern as being a switch character within one of said predetermined classes of patterns and in response thereto projecting said feature vector onto the set of predetermined multi-dimensional subspaces containing said switch character.

4,274,080
MAGNETIC SECURITY SYSTEM

Gerd Brunken, Dittelbrunn, Fed. Rep. of Germany, assignor to Sachs-Systemtechnik GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Oct. 23, 1979, Ser. No. 87,539
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1978, 2847730
Int. Cl.³ H04Q 9/00
U.S. Cl. 340—149 R **5 Claims**



1. A magnetic security system particularly for alarm devices with an electrically actuated lock mechanism comprising: magnetic key means having a plurality of magnet devices defining an operating code; sensor means including magnetic sensors responsive to said magnetic devices operative to read a code defined on said key means when said key means is operatively interposed relative to said sensor means; code storage means operatively associated with said sensor means for storing information representative of a code and for releasing said sensor means when magnetic key means bearing a code stored in said storage means is operatively interposed relative to said sensor means; electrical control means operatively associated with said sensor means for delivering an electrical signal determined by the code on said key means sensed by said sensor means; and means for changing the code stored in said code storage means including lock means for enabling and disabling changes in said stored code; said lock means comprising a mechanical lock, an electrical contact operated by actuation of a push-button and a flap member operative to cover and uncover said push-button to prevent and enable access thereto, said mechanical lock operating to control said flap means.

4,274,081
DATA INPUT APPARATUS

Nobutaka Nomura, Hadano; Hiroshi Kido, Hiratsuka, and Kazunari Yamada, Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

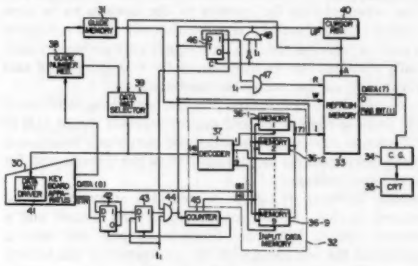
Filed Aug. 7, 1979, Ser. No. 64,507
Claims priority, application Japan, Aug. 11, 1978, 53-97201
Int. Cl.³ G06F 3/14
U.S. Cl. 340—153 **21 Claims**

1. A data input apparatus for inputting various types of data comprising:

display means for displaying a selected one of a plurality of types of guidance information representative of different types of data to be inputted and the order in which the data is to be inputted, said display means including cursor means for designating an area corresponding to a part of said displayed information into which data is to be inputted;

an input device including a plurality of data entry means and definition determining means having a plurality of definitions for each of said entry means for providing each of said entry means with a selected one of said definitions; and

selection means coupled to said definition determining means for selecting one of said definitions for said entry

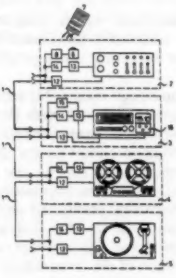


means in response to the area designated by said cursor means and the type of guidance information selected.

4,274,082
TRANSMISSION SYSTEM FOR THE DIGITAL CONTROL OF DEVICES

Heinz Litz; Volker Hallwirth, both of St. Georgen, and Karl Storz, Hardt, all of Fed. Rep. of Germany, assignors to Dual Gebrüder Steidinger, St. Georgen, Fed. Rep. of Germany

Filed Sep. 28, 1979, Ser. No. 79,721
Int. Cl.³ H04Q 5/14, 7/00
U.S. Cl. 340—167 R **2 Claims**



1. Transmission system for the digital control of electrical devices, by means of uniform releaseable pulse combinations corresponding to the desired control operations, which pulse combinations selectively can be sent from at least a first and a second of the devices to be controlled to a line system, the line system connecting all devices in parallel, particularly for the remote control of electronic devices used in the entertainment field comprising

a two-conductor connection line (1) to which all devices to be controlled are connectable in parallel,

an energy supply circuit means (12) disposed in a first one of the devices to be controlled, said circuit means (12) for making available a constant voltage, said constant voltage, upon connection of the device to the connection line (1), being provided as bias voltage to the connection line (1),

a hand-operable control means (6, 7) for the production of the previously mentioned pulse combinations and for making these pulses available as electrical pulses,

a first conversion circuit means (8) in said first device (2), connectable to said connection line (1) with the connection of said first device (2) with the connection line (1) and containing a first circuit means (24, 20, 23), said first circuit means (24, 20, 23) for reducing the bias voltage of the connection line (1) for the duration of a pulse which is received by said hand-operable control means (6, 7) by a

first amount, which amount corresponds to a part of its value, and

a microprocessor means (**13**) arranged in the second device (**3**) equipped for transmission of pulse combinations to a first terminal (**38**) for control of the devices to be controlled and equipped for transmission of a signal voltage to a second terminal (**28, 29**), said signal voltage being essentially constant for the duration of the transmission of said previously mentioned pulse combinations,

adjustment means (**16**) for the predeterminable adjustment of the point in time when said microprocessor means (**13**) of the second device (**3**) transmits said previously mentioned pulse combinations for the control of the devices and for said signal voltage,

a second conversion circuit means (**15**) arranged in said second device (**3**), and containing a first circuit and a second circuit, both said first circuit and said second circuit on the one hand with the connection of the second device (**3**) with said connection line (**1**) being connectable to the connection line (**1**) and on the other hand with said first circuit being connected to said first terminal (**38**) and said second circuit to said second terminal (**28, 29**) of said microprocessor means (**13**) of said second device (**3**),

second circuit means (**37, 39**) arranged in said first circuit for reducing the bias voltage of the connection line (**1**) for the duration of a pulse by an amount which corresponds approximately to double the amount of the first conversion circuit (**8**),

third circuit means (**25, 26**) arranged in the second circuit for lowering the bias voltage of the connection line (**1**) for the duration of the signal voltage by about the same amount as the first circuit means of the first conversion circuit means (**8**),

another microprocessor means (**13**) arranged in another device to be controlled for controlling desired device functions after receiving corresponding pulse combinations,

a third conversion circuit means (**14**) arranged in the another device to be controlled and with the connection of the latter device with said connection line (**1**) on the one hand said third conversion circuit means (**14**) is connectable to said connection line (**1**), and on the other hand is connected with said another microprocessor means (**13**) inside the latter device to be controlled and contains electrical switching means (**40** to **48**), said electrical switching means for coupling out free of direct current the pulse-like voltage reductions of the connection line (**1**) and for retransmitting to the said another microprocessor means (**13**) for triggering of corresponding functions.

4,274,083

APPARATUS FOR IDENTIFYING MOVING OBJECTS

Eiichi Tomoeda, 17-4-503, Sengoku 3-chome, Bunkyo-ku, Tokyo, Japan

Filed Dec. 12, 1978, Ser. No. 968,680

Claims priority, application Japan, Dec. 16, 1977, 52-151477; May 26, 1978, 53-63073

Int. Cl.[3] **H04Q** *9/00;* **G08G** *1/00;* **G01S** *9/56*

U.S. Cl. 340—171 R **6 Claims**

1. Apparatus for identifying each of a plurality of moving objects comprising:

an electromagnetic field generator for radiating over a given area an electromagnetic field having a predetermined frequency,

a plurality of moving object identification signal generators, each adapted for mounting on one of said movable objects and comprising

a receiver unit tuned to said predetermined frequency,

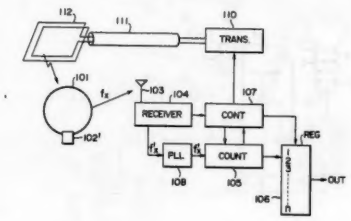
a transmitter unit for transmitting an unmodulated signal at a specific frequency, said specific frequency identifying the particular object on which the signal generator is mounted, and

a timer unit energized by said receiver unit upon receipt of said predetermined frequency, said timer unit then operating said transmitter unit for a predetermined interval which is the same for each of said plurality of signal generators, and

identifying apparatus comprising

a receiver for receiving the unmodulated signals generated by the transmitter units of said signal generators,

a phase locked loop circuit coupled to the output of said receiver, said phase locked loop circuit stabilizing the output of said receiver by generating an output signal



having a frequency coinciding with that of the signal of greatest magnitude among a plurality of signals at the output of said receiver, and

a counter coupled to the outputs of said receiver and said phase locked loop circuit, said counter counting the output of said phase locked circuit when the output of said receiver exceeds a predetermined level to generate an output signal having a code corresponding to the specific frequency of the received signal of greatest magnitude.

4,274,084

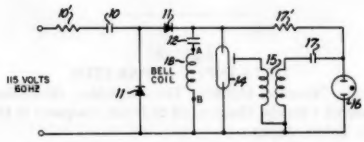
AUDIO-VISUAL SIGNAL CIRCUITS

Rein Haus, Manasquan, N.J., assignor to Wheelock Signals, Inc., Long Branch, N.J.

Filed Oct. 26, 1979, Ser. No. 88,632

Int. Cl.[3] **G08B** *7/00*

U.S. Cl. 340—326 **5 Claims**



1. A circuit for producing an audio-visual alarm comprising:

a flashtube;

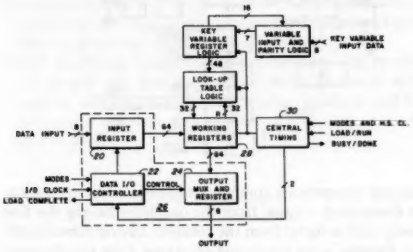
voltage signal generator means for generating and storing a first voltage across said flashtube and a second voltage on the trigger terminal of said flashtube, said first and second voltages increasing in amplitude to a point at which said flashtube operates, discharging the stored voltage and delivering current from said generator means through said flashtube; and

audio signal generator means including a coil located in series with said flashtube and said voltage signal generator means, for producing an audible sound in response to the flow of current from said voltage signal generator means, upon discharge of said stored voltage, the inductance of said coil being such that the current flow through it and the operation of the flashtube are not adversely affected.

4,274,085
FLEXIBLE MODE DES SYSTEM

Joseph T. Marino, Jr., Chandler, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 28, 1979, Ser. No. 53,018
Int. Cl.[3] G06F *5/04*
U.S. Cl. 340—347 DD **4 Claims**



1. In a digital processing system, the combination comprising:

at least one working register, said at least one working register having an input and outputs, said outputs further comprising:

a predetermined byte position output; and

a plurality of byte position outputs;

an input register, said input register being controllable for accepting one of serial and parallel inputs, said input register further comprising a plurality of switching means for switching a plurality of sub-registers of said input register to one of serial and parallel configuration;

an output circuit, said output circuit having connections to said at least one working register for accepting one of a single byte from said predetermined position in said at least one working register and a plurality of bytes from said plurality of byte positions in said at least one working register, said output circuit being controllable for outputting one of a serial bit stream and a serial stream of parallel bytes, said output circuit being connected to said input register;

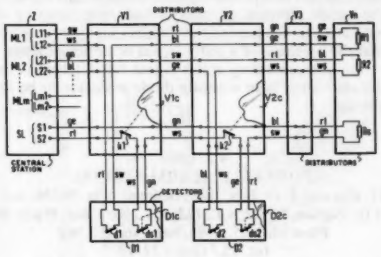
a control circuit, said control circuit being connected to said input register, said at least one working register and to said output circuit, said control circuit being adapted to select one of said outputs of said at least one working register for application to said output circuit, one of said serial and parallel inputs to said input register and one of said outputs of said output circuit, said control circuit being adapted to supply clock pulses to said input register, said working register and said output circuit, said clock pulses having timing sequences responsive to a combination of said selections of said control circuit.

4,274,086
SECURITY ALARM SYSTEM

Wolfgang Benckendorff, Peissenberg, and Hans Kübler, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 2, 1979, Ser. No. 53,685
Claims priority, application Fed. Rep. of Germany, Aug. 3, 1978, 2834143
Int. Cl.[3] G08B *23/00, 17/00*
U.S. Cl. 340—506 **4 Claims**

1. In an alarm system of the type in which a plurality of current paths extend as alarm lines from a central station to a plurality of detectors by way of a plurality of distributors, and in which the current path alarm lines are defined by a first cable section extending between the central station and a first distributor, a plurality of second cable sections extending between adjacent distributors, and a plurality of third cable sections extending between the distributors and respective detectors, and in which the cable sections have color-coded conductors therein for the alarm lines, the improvement wherein:

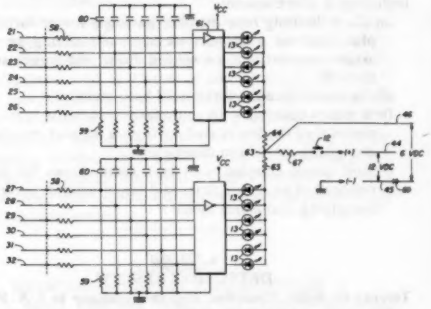


the color-coded conductors of each of the cable sections being randomly interconnected with different color-codes connected to one another such that each color-coded conductor of each cable section defines a different current path alarm line between their respective system elements connected thereby.

4,274,087
ANNUNCIATOR MONITOR CIRCUIT

Dan E. Swanson, 1340 Paradise Dr., Martinez, and Frederick A. Reschert, 2734 Kevin Rd., San Pablo, both of Calif.

Filed Aug. 22, 1979, Ser. No. 68,836
Int. Cl.[3] G08B *25/00*
U.S. Cl. 340—525 **10 Claims**



1. An annunciator monitor for use with a protection loop having a plurality of series connected status switches, said annunciator monitor comprising:

power input terminal means adapted to be coupled to a source of electrical power;

a plurality of status signal input terminals adapted to be coupled in a preferred order between said status switches, each of said status signal input terminals being adapted to be coupled between a different pair of said plurality of status switches;

a plurality of input resistor divider networks each coupled between a different one of said status signal input terminals and ground for providing a minimum operating voltage threshold signal at an output terminal thereof, each said resistor divider network having a relatively high input resistance;

a plurality of high sensitivity low power gating circuits each having an input terminal coupled to the output terminal of a different one of said plurality of input resistance divider networks;

a plurality of light emitting diode indicators each having a cathode terminal coupled to a different one of said plurality of gating circuits and an anode terminal coupled to a common junction; and

power application means coupled between said common junction and said power input terminal means for enabling the anode terminal of each of said light emitting diode indicators to be coupled to said electrical power source so that the presence of a status signal of sufficient magnitude at the corresponding status signal input terminal causes the associated light emitting diode indicator to be illuminated.

4,274,088

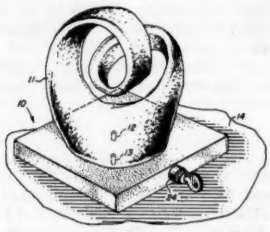
PORTABLE ALARM SYSTEM

Don H. Pierson, P.O. Box 1849, Sedona, Ariz. 86336, and Robert D. Pierson, 10943 N.E. 133rd St., Kirkland, Wash. 98033

Filed May 27, 1980, Ser. No. 153,169

Int. Cl.³ G08B *13/14*

U.S. Cl. 340—568 **10 Claims**



1. A portable alarm system for protecting exposed valuables including in combination;

an alarm housing base member having a lower surface for placement on a support member and having an upper article support surface spaced from said lower surface thereof;

alarm means located within said base member;

first means coupled with said alarm means for sensing the removal of the lower surface from a support member for energizing said alarm means; and

second means coupled with said alarm means for sensing removal of an article from said upper support surface for energizing said alarm means.

4,274,089

DETECTION SYSTEM

Terence G. Giles, Coulsdon, England, assignor to U.S. Philips Corporation, New York, N.Y.

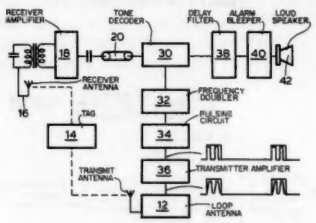
Filed May 21, 1979, Ser. No. 41,225

Claims priority, application United Kingdom, May 19, 1978, 20705/78

Int. Cl.³ G08B *13/22*

U.S. Cl. 340—572 **9 Claims**

1. A detection system comprising an oscillator for generating a signal having a first frequency, a transmitter having an aerial for transmitting an interrogating signal, a responder movable relative to the aerial having a first resonant circuit for detecting the interrogating signal, having a second resonant circuit for transmitting a reply signal, the resonant circuits being tuned to frequencies mathematically related to each other and being interconnected by a coupling device which activates the second resonant circuit in response to the detection of the interrogating signal, the system further comprising a receiver having an aerial for receiving the reply signal, a detector coupled to a receiver output and an indicator coupled to a detector output and signalling the presence of a responder characterized in that a frequency changer is connected between the oscillator and the transmitter for producing as said interrogating signal a second signal having a second frequency which is related mathematically to the first frequency, that the first resonant circuit is tuned to the second frequency and the second resonant circuit is tuned to the first frequency and that



the detector comprises a comparator connected to the oscillator for comparing a signal from the oscillator having the first frequency with a signal from the receiver having substantially the first frequency for producing an output if the two frequencies are substantially the same.

4,274,090

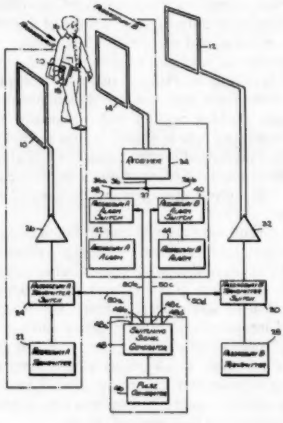
DETECTION OF ARTICLES IN ADJACENT PASSAGEWAYS

Michael N. Cooper, Flushing, N.Y., assignor to Knogo Corporation, Hicksville, N.Y.

Filed Feb. 19, 1980, Ser. No. 122,807

Int. Cl.³ G08B *13/24*

U.S. Cl. 340—572 **8 Claims**



1. An article theft detection system for identifying which of two ciosely positioned passageways a protected article passes through, said system comprising

transmitter means including, first and second transmitter antennas for producing electromagnetic interrogation signals in the vicinity thereof,

receiver means including a single receiver antenna positioned between said first and second transmitter antennas to define first and second adjacent passageways each extending between said receiver antenna and a different one of said transmitter antennas so that each passageway has produced therein the interrogation signal for its associated transmitter antenna,

at least one electronic target capable of being mounted on an article for protecting said article, said target comprising an electrical device which, when present in one of said pas-

sageways, reacts with the interrogation signal therein to produce predetermined electromagnetic disturbances at said single receiver antenna,

said receiver means being responsive to said predetermined electromagnetic disturbances to produce electrical alarm signals at a receiver output,

first and second alarm means each being operable by said electrical alarm signal to produce a recognizable alarm,

first switching means arranged to cause said first and second transmitter antennas to produce said interrogation signals alternately during successive time intervals, and

further switching means connected between the receiver output and said first and second alarm means to apply receiver outputs, including said alarm signals, to said first and second alarm means alternately during said successive time intervals.

4,274,091

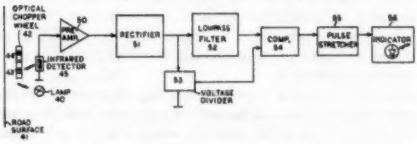
ROAD SURFACE ICE DETECTOR AND METHOD FOR VEHICLES

Peter W. Decker, Sausenheimer Str. 29, 6718 Grunstadt 1, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 884,908, Mar. 9, 1978, abandoned. This application Jan. 17, 1979, Ser. No. 4,173

Int. Cl.³ G01J *3/34*; G08B *21/00*

U.S. Cl. 340—583 **11 Claims**



1. A method of detecting from vehicles the presence of ice on traveling surfaces comprising:

generating a train of light pulses from light originating at the vehicle and reflected from the traveling surface for return to the vehicle for detection, and processing said light pulse train to comprise interleaved measurement light pulses and reference light pulses, said measurement light pulses comprising frequencies in at least one absorption band for ice, and said reference pulses comprising frequencies outside the absorption bands of ice;

detecting at the vehicle said light pulse train and generating electrical signal pulses corresponding in amplitude to the detected light pulses, thereby providing a train of interleaved measurement and reference electrical signal pulses;

dividing said generated electrical signal pulse train along first and second parallel electrical paths; deriving a mean value voltage signal from the amplitude of the measurement and reference pulses of the electrical signal pulse train along said first path;

adjusting the amplitude of the pulses in said second path to equal or not exceed the mean value voltage derived in the first path with no ice on the traveling surface when the measuring and reference pulses are substantially unchanged;

comparing the amplitude of signals in the first and second paths and generating pulses when each reference pulse in the second path exceeds the mean value voltage in the first path by a threshold difference;

processing said comparison threshold difference indicating pulses for indicating the presence of ice on the traveling surface.

4,274,092

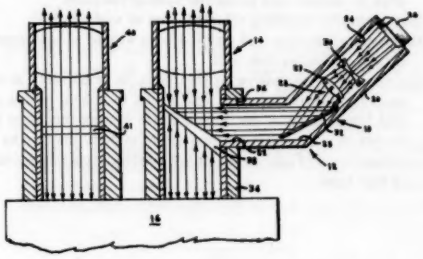
DISPLAY SYSTEM FOR MICROSCOPIC OPTICAL INSTRUMENTS

Richard S. Vonusa, and Jeffrey P. Woodard, both of Rome, N.Y., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 7, 1979, Ser. No. 91,991

Int. Cl.³ G06F *3/14*

U.S. Cl. 340—705 **8 Claims**



1. In an optical viewing instrument having at least one eyepiece incorporated therein and said eyepiece having a surrounding side wall and an opening at an end thereof for viewing imagery in optical alignment therewith, the improvement therein being in the form of a display system, said display system comprising an aperture located in said side wall of said eyepiece, a hollow housing having a pair of open ends, said housing being connected adjacent one of said open ends thereof to said side wall of said eyepiece and in optical alignment with said aperture, a display means operably connected to the other of said open ends of said housing for providing a beam of radiant energy containing information, focusing means located within said housing and in optical alignment with said beam of radiation containing information for directing said beam through said aperture in said eyepiece, directing means located within said eyepiece adjacent said aperture and in optical alignment with said beam of radiant energy for directing both said imagery and said beam through said opening in said eyepiece to an observer using said optical instrument, said information from said display means being superimposed over said imagery, whereby said observer can utilize said optical instrument for viewing both said imagery located in optical alignment with said optical instrument and said information from said display means.

4,274,093

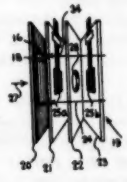
KEYBOARD-DISPLAY COMBINATION

John F. X. Judge, Yorktown Heights, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Feb. 26, 1979, Ser. No. 15,018

Int. Cl.³ G06F *3/14*

U.S. Cl. 340—712 **10 Claims**



1. A keyboard-display arrangement in combination with a controlled system capable of performing a plurality of system functions, comprising:

a flexible screen having extended upper and lower surfaces;

a series of keys which are functionally and structurally integral with said screen and disposed in an array, each of said keys being substantially invisible when disabled and visible when enabled at said upper surface of said screen, each of said keys being operative to initiate a particular system function and comprising a contact switch responsive to and actuated upon depression of a corresponding surface portion of said screen, said controlled system being responsive to each of said keys, as selectively actuated, to initiate said particular system function;

first means for enabling selected ones of said keys;

means for rendering said enabled keys visible at said upper surface of said screen; and

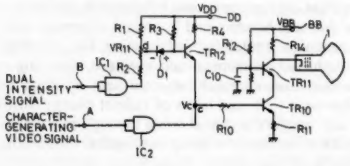
second means responsive to said keys, as selectively actuated, for controlling said first means to enable others of said keys operative to initiate other system functions in proper sequence with said particular system function by a selected one of said keys and for disabling remaining ones of said keys.

4,274,094

CATHODE-RAY TUBE DISPLAY APPARATUS

Satoshi Noguchi, Fujisawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jun. 5, 1979, Ser. No. 45,766
Claims priority, application Japan, Jun. 13, 1978, 53-71709
Int. Cl.[3] G08B 5/36
U.S. Cl. 340—723 **14 Claims**



1. A video amplifier circuit for cathode ray tube display apparatus comprising:

a cathode ray tube,

a first switching element for receiving an input video signal and for making a switching action in response to said input video signal,

a second switching element for receiving an input dual intensity signal for shifting the intensity level of selected parts of the images displayed on a screen of said cathode ray tube into a brighter accentuated intensity level and a darker non-accentuated intensity level, and

a video signal amplifying stage,

a variable voltage feeding circuit comprising a variable voltage dividing circuit connected between an output terminal of said second switching element and a power supply terminal,

a transistor connected by its collector substantially to said power supply terminal and by its emitter to an output terminal of said first switching element and to an input terminal of said video signal amplifying stage,

a diode connected between a variable voltage output terminal of said variable voltage feeding circuit and the base of said transistor, the direction of said diode being backward to the direction of the base current of said transistor, and

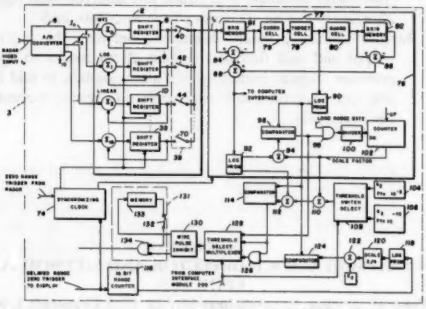
a base resistor connected to said base to feed the base current of said transistor.

4,274,095

RADAR VIDEO CONVERTER

Joe Phipps, Westminster; Robert E. Thurber, Silver Spring, and Richard J. Prengaman, Severna Park, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 21, 1979, Ser. No. 22,402
Int. Cl.[3] G02S 7/44
U.S. Cl. 343—7 A **8 Claims**



1. A radar video converter for interfacing a two-dimension sweeping radar and a digital computer, comprising:

an adaptive video processor which comprises:

an azimuth integration stage, having video returns in digital form as inputs, for summing the video returns at each of a plurality of azimuths, the sum for each azimuth being taken over a plurality of ranges, and for providing an output corresponding to the sum of video returns at each respective azimuth,

a mean level detector stage for receiving the output from the azimuth integration stage and for suggesting the presence of a target at a given azimuth when a target cell signal corresponding to the video return at the given azimuth at a given time exceeds a background threshold derived from signals at neighboring azimuths combined in a predetermined fashion,

a batch/batch correlation stage for determining target detection correlation between successive sums of video returns summed at a given range on subsequent sweeps,

means for providing a plurality of fixed threshold levels,

means for separately comparing the fixed threshold levels with the target cell signal of the mean level detector stage, and

threshold selection multiplexer means for selecting the mean level detector output or one of the fixed threshold comparing means outputs for use in determining a target detection output.

4,274,096

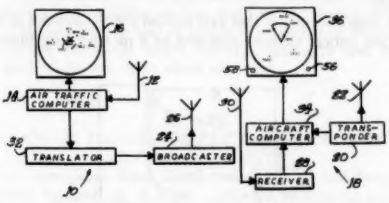
AIRCRAFT PROXIMITY MONITORING SYSTEM

Terry A. Dennison, 1133 Elizabeth, Naperville, Ill. 60540

Filed Jul. 9, 1979, Ser. No. 55,992
Int. Cl.[3] G01S 3/02
U.S. Cl. 343—112 TC **19 Claims**

1. An aircraft proximity monitoring system comprising: ground-based means for continuously and repeatedly deriving and transmitting signal information representative of the speeds and positions relative to a first location of each and every one of a plurality of aircraft within a predetermined range of said first location, means on at least one of said plurality aircraft within said range of said first location for receiving said signal information, means on said one aircraft for identifying the portion of said signal information corresponding to said one aircraft, means for transposing said signal information so as to form second signal information corresponding to the posi-

tions of others of said plurality of aircraft relative to the position of said one aircraft and means on said one aircraft responsive to said second signal information for aiding in the naviga-



tion of said one aircraft with respect to the positions of at least selected ones of said other aircraft relative to the position of said one aircraft.

4,274,097

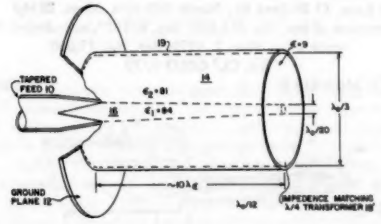
EMBEDDED DIELECTRIC ROD ANTENNA

Albert D. Krall, Rockville, and Albert M. Syeles, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 565,292, Mar. 25, 1975, abandoned. This application Mar. 21, 1980, Ser. No. 132,457

Int. Cl.³ H01Q *13/24*

U.S. Cl. 343—719 **25 Claims**



1. An end-fired antenna element for projecting a narrow beam of energy into the surrounding environment, comprising:

feed means terminating in an aperature;

a dielectric rod of a material having a dielectric constant ϵ_1 coupled to the aperture and extending longitudinally therefrom;

a dielectric material surrounding said dielectric rod along the length thereof having a dielectric constant $\epsilon_2 \geq 81$ and substantially greater than the dielectric constant of the environment but less than the dielectric constant ϵ_1.

4,274,098

LOSS-FREE SCANNING ANTENNA

Jacques Renau, Culver City; James W. Curtis, Riverside; Donald S. Nicholson, and Frank L. Hennessey, both of Los Angeles, all of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 7, 1980, Ser. No. 128,343

Int. Cl.³ H01Q *19/19*

U.S. Cl. 343—781 CA **3 Claims**

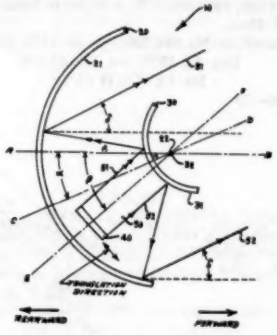
1. A two dimensional scan, loss-free, Cassegrain antenna system, comprising:

a. a stationary primary reflector in the geometric form of a parabolic surface having a front surface, a focal point, a focal length (f_1), and an axis passing through said focal point;

b. a movable subreflector in the geometric form of a parabolic surface having a rear surface and a focal length (f_2), with said subreflector being smaller than, confocal with, forward of, and facing away from said front surface of said stationary primary reflector, and with said movable subreflector having an axis passing through said focal point of said stationary primary reflector whereat this axis intersects said stationary primary reflector axis and these said intersecting axes define an angle of rotation (α) of said movable subreflector, and wherein said focal length (f_2) of said movable subreflector and said focal length (f_1) of said stationary primary reflector are related to each other in accordance with the ratio expression:

$$(f_1/f_2) > 1;$$

c. and, a plane wave, movable, electromagnetic radiation source emitting a collimated beam and having an axis passing through said focal point of said stationary primary reflector whereat this axis intersects said stationary primary reflector axis and these intersecting axes define an angle of rotation (β) of said movable source, with said source interposed between said stationary primary reflector and said movable subreflector, and with said source simultaneously disposed such that all rays of said collimated beam emitted by said source impinge upon, and are reflected by, said rear surface of said movable subreflector and, in turn, impinge upon, and are reflected by, said front surface of said stationary primary reflector at a constant, preselected, scan angle (δ), wherein said scan angle is determined by use of the equations



$$\delta = \beta - 2\alpha \text{ and } \sin(\beta - \alpha) = (f_1/f_2)\sin\delta$$

where:

δ = constant scan angle

β = angle of rotation of said movable source

α = angle of rotation of said movable subreflector;

whereby a relationship is established among the angles δ, β and α; and whereby said collimated electromagnetic radiation beam emitted by said source can be scanned, without loss, by said stationary primary reflector at a constant, preselected, scan angle without moving said primary reflector, and by rotating said source and said subreflector about said focal point of said primary reflector, while maintaining said relationship established by said equation.

4,274,099

RANDOM CONDUCTIVE ROVING REFLECTIVE SURFACING FOR ANTENNAS AND GUIDES

James W. Downs, 3917 Villanova, Dallas, Tex. 75225

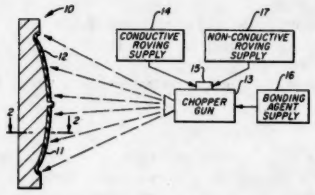
Filed Feb. 26, 1979, Ser. No. 15,856

Int. Cl.³ H01Q *15/14*

U.S. Cl. 343—912 **13 Claims**

1. In a RF signal reflective surface equipped structure: conductive roving element lengths randomly positioned and held in place by bonding agent means; with said conductive roving

element lengths with said bonding agent means having a molded surface in the selected RF signal reflective surface shape; and wherein said conductive roving element lengths are



cut lengths of conductive material coated fiberglass fibers randomly deposited to desired density in a layer of conductive roving enclosed in said bonding agent means.

4,274,100

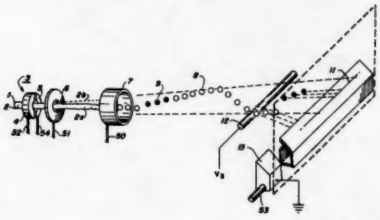
ELECTROSTATIC SCANNING INK JET SYSTEM

Stephen F. Pond, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 894,799, Apr. 10, 1978. This application Oct. 11, 1979, Ser. No. 84,010

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—75 **24 Claims**



1. A fluid drop scanning recording system, comprising

drop generation means including means for ejecting conductive fluid from a nozzle in a continuous stream toward a print plane and means for exciting the fluid to break up the continuous stream into drops at a point of drop formation,

charging electrode means positioned between the nozzle and the print plane in close proximity to the continuous stream at the point of drop formation for selectively charging the drops,

scanning electrode means located between the nozzle and charging means for periodically, electrostatically deflecting the continuous stream prior to the point of drop formation to obtain a lateral distribution of the drops formed from the stream,

drop collection means located between the charging means and print plane and

electrostatic deflection means for deflecting charged drops to either the collection means or the print plane.

4,274,101

LASER RECORDER WITH PIEZOELECTRIC BIMORPH FOCAL LENGTH VIBRATOR

Keiji Kataoka, Kawagoe; Kimio Tatsuno, Kokubunji, and Susumu Saito, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 17, 1979, Ser. No. 76,427

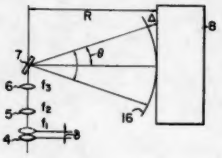
Claims priority, application Japan, Sep. 18, 1978, 53-126960

Int. Cl.³ G01D *9/42*; G02B *7/02, 27/17*

U.S. Cl. 346—108 **4 Claims**

1. In an information recording apparatus comprising a laser source for emitting a laser beam, an optical scanner for deflecting said laser beam at a predetermined deflection angle, recording means having a surface on which the deflected laser beam is recorded, and optical means for guiding to the surface of said recording means said laser beam emitted from said laser source,

the improvement in that said optical means includes at least one optical element attached to a piezoelectric bimorph



element, said piezoelectric bimorph element being driven by drive means which generates a predetermined electric signal for displacing said optical element in correspondence to the deflection angle of the laser beam deflected by said optical scanner, whereby the deflected laser beam is converted into a predetermined small light spot at any position on the surface of said recording means.

4,274,102

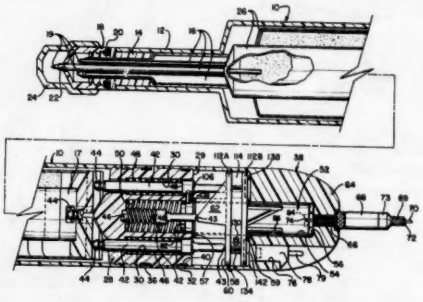
MULTI-ELEMENT WRITING INSTRUMENT

Victor Lum, 17 Pollard St., North Billerica, Mass. 08162

Continuation of Ser. No. 831,610, Sep. 8, 1977, abandoned. This application Mar. 2, 1979, Ser. No. 17,060

Int. Cl.³ G01D *9/30*

U.S. Cl. 346—139 R **26 Claims**



18. In a writing instrument of the type comprising an elongated hollow body having at one end thereof an exit opening, a plurality of elongated writing elements disposed in said body, each including a writing point at one end, said writing elements being positioned substantially parallel to and radially spaced from a center axis and mounted so that said elements can be selectively and sequentially moved substantially parallel to said axis between a retracted position wherein the writing point of a selected one of said elements is disposed within said body and an extended position wherein the writing point of said selected element extends through said exit opening; selection means for selectively and sequentially moving each of said elements from its retracted position to its extended position; and means for moving each of said elements from said extended position to said retracted position, the improvement wherein:

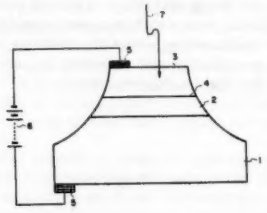
said selection means comprises (1) first camming means including a cylinder coaxially mounted with respect to said axis and having a cam formed on the cylindrical surface so as to provide a continuous path around said surface, said first camming means being movable, relative

to said body, substantially only linearly along said axis in response to an axial force applied to said first camming means in the direction of said axis; and (2) second camming means mounted coaxially with said first camming means and including at least one follower in engagement with said cam so that in response to said axial force said second camming means moves, relative to said body, exclusively angularly about said axis.

4,274,103
AVALANCHE PHOTODIODE WITH SEMICONDUCTOR HETERO STRUCTURE

Takaya Yamamoto, Niza; Kazuo Sakai, Tokyo, and Shigeyuki Akiba, Tanashi, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 21, 1979, Ser. No. 50,628
Claims priority, application Japan, Jul. 17, 1978, 53-86130
Int. Cl.³ H01L *29/90, 29/161, 27/14*
U.S. Cl. 357—13 **4 Claims**



3. An avalanche semiconductor photodiode comprising: a semiconductor substrate; a first semiconductor layer formed on a surface of said substrate and conducting in an avalanche mode, in operation; and a second semiconductor layer formed on a surface of said first semiconductor layer opposite said substrate, said second semiconductor layer receptive of light energy from light incident thereon in use for rendering the photodiode conductive, and said second semiconductor layer having a composition including chemical components different than the composition of said first semiconductor layer and having lattice constants substantially matched with the lattice constants of said first semiconductor layer, wherein said first and said second semiconductor layers are respectively comprised of one of the pairs of compounds selected from the group consisting of

$In_{1-x}Ga_xAs_yP_{1-x}$ and GaAs,
$In_{1-x}Ga_xSb_yP_{1-y}$ and InP,
$In_{1-x}Ga_xAs_yP_{1-y}$ and InP,
$A1_{1-x}Ga_xAs_ySb_{1-y}$ and GaSb, and
$In_{1-x}Ga_xAs_ySb_{1-y}$ and InAs.

4,274,104
ELECTROOPTICAL INTEGRATED CIRCUIT COMMUNICATION

Frank F. Fang, and Roland Y. Hung, both of Yorktown Heights, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 21, 1979, Ser. No. 41,115
Int. Cl.³ H01L *31/12*
U.S. Cl. 357—19 **6 Claims**

1. An integrated circuit structure comprising in combination:

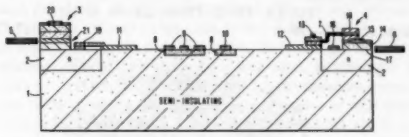
a semiconductor member of a material having at least in selected areas the semiconductor properties of both high carrier mobility and high electrooptical conversion;

at least one optical signal output member operable to communicate information signals from said semiconductor member;

an electrical-to-light electrooptical conversion means employing said material of said semiconductor member positioned in a discrete area of said semiconductor member adjacent to and in optical coupling relationship with each said optical signal output member;

at least one optical signal input member operable to communicate information signals to said semiconductor member;

an optical-to-electrical electrooptical conversion means employing the material of said semiconductor member



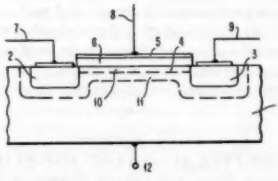
positioned in a discrete area of said semiconductor member adjacent to and in optical coupling with each said optical signal input member; and

at least one active semiconductor in a discrete area of said semiconductor member employing said material of said semiconductor member and operable to process signals between said at least one input and said at least one output.

4,274,105
MOSFET SUBSTRATE SENSITIVITY CONTROL

Billy L. Crowder, Putnam Valley; Fritz H. Gaensslen, Yorktown Heights, both of N.Y., and Richard C. Jaeger, Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1978, Ser. No. 974,594
Int. Cl.³ H01L *29/78, 29/167*
U.S. Cl. 357—23 **3 Claims**



1. A metal oxide semiconductor field effect transistor comprising in combination:

a substrate of a semiconductor material having a first conductivity type;

a source region and a drain region separated by a channel region in a first surface of said substrate each said source region and said drain region being of a conductivity type opposite to said first conductivity type of said substrate;

a gate electrode adjacent to and separated by an oxide layer from said channel region positioned between said source region and said drain region; and

a substrate sensitivity control region in said substrate aligned with said gate and spaced from said first surface containing low diffusivity deep level impurities of the opposite conductivity type to said first conductivity type in sufficient quantities to provide substantially equivalent opposite charges to compensate for the increase in charges that occur in said channel region as a result of an increase in source region to substrate voltage over the range of operation of said transistor.

4,274,106

EXPLOSION PROOF VIBRATION RESISTANT FLAT PACKAGE SEMICONDUCTOR DEVICE

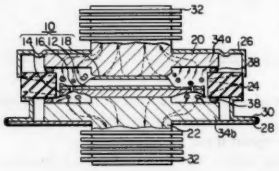
Mitsuo Ohdate, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 3, 1978, Ser. No. 957,330

Claims priority, application Japan, Nov. 7, 1977, 52-133787; Nov. 7, 1977, 52-149700[U]; Nov. 30, 1977, 52-144320; Jun. 9, 1978, 53-70098

Int. Cl.³ H01L *23/42, 23/44, 23/46*

U.S. Cl. 357—79 **17 Claims**



1. A flat package semiconductor device comprising, in combination, a hollow electrically insulating cylinder, a pair of opposed electrodes disposed on opposite end surfaces of said hollow electrically insulating cylinder, a semiconductor element sandwiched between said pair of cylindrical electrodes, a thin metallic annulus hermetically connected to each of said end surfaces of said hollow electrically insulating cylinder and supporting each of said electrodes to form a hermetic enclosure with said hollow electrically insulating cylinder and said electrodes, said electrically insulating cylinder having an internal inwardly extending circumferential protrusion between said electrodes, a circumferential protrusion within said hermetic enclosure radially extending from each of said electrodes opposite said internal protrusion of said hollow electrically insulating cylinder and spaced axially therefrom, and means for isolating physically said circumferential protrusions and said semiconductor element from said electrically insulating cylinder and each of said thin metallic annuli, said means being maintained in a mechanically compressed state due to a pressure applied across said electrodes and said means maintaining said internal protrusion of said electrically insulating cylinder between said circumferential protrusions of said electrodes and permitting said electrodes to be displaced with respect to said electrically insulating cylinder axially thereof.

4,274,107

MEMORY-TYPE AUTOMATIC ADJUSTMENT SYSTEM

Eiji Tamura, Tama, and Takashi Nakamura, Hadano, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 27, 1978, Ser. No. 881,372

Claims priority, application Japan, Feb. 28, 1977, 52-21848

Int. Cl.³ H04N *9/535;* **H03K** *21/36*

U.S. Cl. 358—29 **19 Claims**

1. A memory-type control system for producing and storing a control signal, comprising:

signal providing means for providing a signal having a level to be controlled;

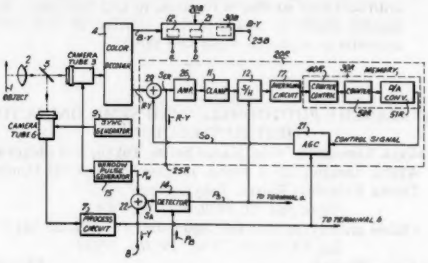
detecting means for receiving said signal for detecting when said level is within a predetermined range;

a source of clock pulses;

UP/DOWN counting means for counting said clock pulses, said UP/DOWN counting means being responsive to said detecting means for counting in one direction when said level is greater than said predetermined range, for counting in a second direction when said level is less than said predetermined range and for ceasing said counting when said level is within said range so as to store the last-attained count;

level control means coupled to said counting means for using said count as a control signal to adjust said level so as to bring said level within said predetermined range:

preset means for presetting said counting means with a predetermined count; and



switch means having a first condition to inhibit said counting means and being operable to a second condition to load said counting means with said predetermined count and to enable said counting means for initiating a level adjustment operation by said detecting means, said counting means and said level control means.

4,274,108

INTERLEAVED MULTIPLE SIGNAL SEPARATING CIRCUIT

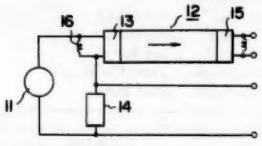
Takeo Yokoyama, Ebina; Kiyoshi Fukumoto, Sagamihara, and Hiroshi Matsuura, Yokohama, all of Japan, assignors to Showa Electric Wire & Cable Co., Ltd., Kawasaki, Japan

Filed Jun. 27, 1979, Ser. No. 52,466

Claims priority, application Japan, Jul. 3, 1978, 53-80731; Apr. 28, 1979, 54-52764

Int. Cl.³ H04N *9/535*

U.S. Cl. 358—31 **5 Claims**



1. An interleaved multiple signal separating circuit in which a luminance signal and a chrominance signal are separated by a circuit for adding a composite video input signal including said luminance signal and chrominance signal which is delayed by a predetermined period of time by an ultrasonic solid delay line to said composite video input signal and by a circuit for subtracting said delayed composite video input signal from said composite video input signal; comprising:

a series circuit of an input transducer of said ultrasonic solid delay line and a voltage division load connected to said input transducer,

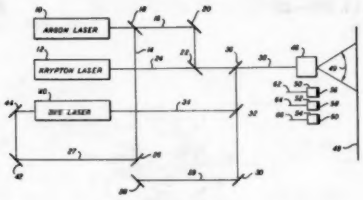
said input signal being applied across said series circuit.

a delay output signal fqom an output transducer of said ultrasonic solid delay line and a signal across said voltage division load being combined to provide the sum and the difference of said two signals.

4,274,109
SCANNED BEAM COLOR VIDEO GENERATOR

Clyde M. Whitby, Duncanville, Tex., assignor to The Singer Company, Binghamton, N.Y.

Filed Dec. 10, 1979, Ser. No. 102,051
Int. Cl.³ H04N *9/10*
U.S. Cl. 358—53 **9 Claims**



1. A scanned light beam color video signal generation apparatus for use in conjunction with a scene colored by at least two different pigments, comprising:

(a) photoelectric means for detecting incident light thereon and providing as an output three signals containing information as to the relative spectral content of the incident light in each of three primary color wavelength regions, respectively, such that said three signals comprise a color video signal;

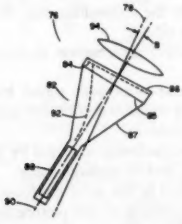
(b) light beam generating means for generating a beam of white light comprising four monochromatic spectral components, wherein three of said components comprise primary color components in the red, green and blue spectral regions, respectively, and said fourth component comprises a monochromatic component intermediate in wavelength of two of said primary color components such that said fourth component lies in wavelength approximately between adjacent color distinguishable pigment reflectance fall-off regions; and

(c) scanning means for scanning said beam of white light onto said scene, whereby the portion of said beam of white light which is reflected off of said scene is said incident light which said photoelectric means detects.

4,274,110
PROJECTION TELEVISION SYSTEM

Stanley E. Lehnert, Addison, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Jan. 8, 1980, Ser. No. 110,413
Int. Cl.³ H04N *9/31, 9/18, 5/74*
U.S. Cl. 358—60 **17 Claims**



1. For use in a projection television system having a projection screen for displaying a light image cast thereon, said screen being spaced apart from at least one light projection means whose projection optical axis lies at a non-zero, acute-angle A with respect to the screen axis, said light projection means comprising:

cathode ray tube means having a cathodoluminescent screen on the inside surface of a face panel thereof whose axis is substantially parallel to said projection optical axis, and electron-beam generating means disposed on the cathode ray tube electron-optical axis for forming an electron image on said cathodoluminescent screen which is converted to a visible image by said screen;

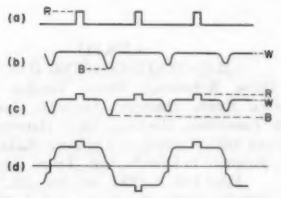
lens means on said projection optical axis for projecting on said projection screen the light image of the electron-formed visible image on said cathodoluminescent screen, said light image inherently having non-linear magnification distortion attributable to the location of said projection means off said projection screen axis;

said system being characterized by the cathode ray tube electron-optical axis defining a non-zero, acute-angle B with respect to the axis of said cathodoluminescent screen, the value of said angle B and the orientation of said electron-optical axis being selected to cause said electron-formed visible image to have an orientation and non-linear magnification distortion effective to substantially compensate for said off-axis-induced non-linear magnification distortion of said projected light image.

4,274,111
COLOR FACSIMILE SIGNAL TRANSMISSION SYSTEM

Katsuo Murase, Hachioji, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Apr. 14, 1980, Ser. No. 140,113
Claims priority, application Japan, Apr. 18, 1979, 54-47550
Int. Cl.³ H04N *1/46, 9/36, 1/41*
U.S. Cl. 358—75 **3 Claims**



1. A color facsimile signal transmission system wherein the transmitting side comprises means for setting a color signal at a level higher than that of a black-and-white signal, means for combining said color signal and said black-and-white signal to form a composite signal wherein said color signal is superimposed upon said black-and-white signal, means for converting said composite signal into a three-value signal, and means for modulating and transmitting said three-value signal; and the receiving side comprises means for receiving and demodulating said transmitted three-value signal, means for converting said demodulated three-value signal into a binary signal, and means for detecting the level of said binary signal and for separating said color signal and said black-and-white signal therefrom.

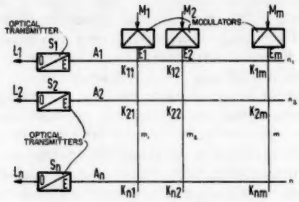
4,274,112
SWITCHING MATRIX FOR SELECTIVELY CONNECTING INCOMING SIGNALS TO DESIRED OUTPUT PATHS

Hans Leysieffer, Icking, and Klaus Panzer, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 28, 1979, Ser. No. 53,090
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1978, 2828662
Int. Cl.³ H04N *5/22*
U.S. Cl. 358—181 **9 Claims**

1. A circuit arrangement for selectively connecting a plurality of input lines to a plurality of output lines for passing or blocking wide band modulated carrier signals which are pulse, phase, pulse duration, pulse phase, or pulse frequency modu-

lated, comprising a plurality of modulators to which said plurality of input lines are connected and performing modulation on signals passing therethrough, an electronic switching matrix with a plurality of row and column lines which cross each



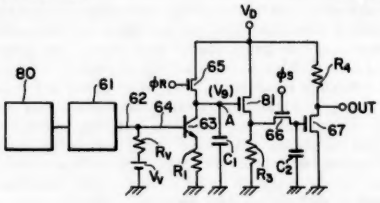
other with electronic switching means at the crossing points, the outputs of said plurality of modulators connected to said plurality of column lines, a plurality of optical transmitters connected to said plurality of row lines, and a plurality of output lines connected to said plurality of optical transmitters.

4,274,113

SOLID-STATE IMAGING DEVICE

Shinya Ohba, Kokubunji; Shuhei Tanaka, Higashiyamato; Masaharu Kubo, Hachioji; Haruhisa Ando, Kokubunji; Yataro Yamashita, Hachioji; Shoji Hanamura, Kokubunji; Masakazu Aoki, Hachioji, and Masaaki Nakai, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 5, 1980, Ser. No. 118,743
Claims priority, application Japan, Feb. 7, 1979, 54-12248
Int. Cl.³ H04N *3/12, 3/14*
U.S. Cl. 358—212 **11 Claims**



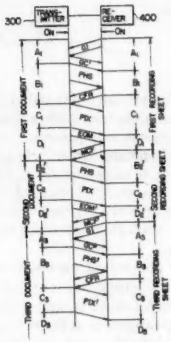
1. In a solid-state imaging device having a sensor portion which reads out photo information stored in a plurality of photodiodes disposed in a surface region of a semiconductor body, with a discontinuous horizontal scanning pulse train, and a signal processing circuit which integrates and eliminates noise components of video signals provided from said sensor portion; a solid-state imaging device characterized in that said signal processing circuit comprises a first emitter (source) follower circuit in which a first transistor receiving the video signals and a first load are connected in series, a second transistor which is connected in series with said first emitter (source) follower circuit and which receives a reset signal, a capacitance which is connected between a collector of said first transistor and a ground terminal, and a second emitter (source) follower circuit which receives a collector (drain) output of said first transistor and which detects an integration value of a discharge current of said capacitance.

4,274,114

PICTURE INFORMATION TRANSMITTING METHOD FOR FACSIMILE

Yasuyuki Kozima, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 1, 1979, Ser. No. 90,430
Claims priority, application Japan, Nov. 6, 1978, 53-135811
Int. Cl.³ H04N *1/32, 1/36*
U.S. Cl. 358—257 **8 Claims**



1. A picture information transmitting method for a facsimile system comprising steps of;

sending a group identifying signal by receiver informing that the receiver is in a reception ready mode,

transmitting a group command signal by a transmitter which has determined a transmitting mode in response to the received group identifying signal,

transmitting a phasing signal by the transmitter in succession to termination of the group command signal,

sending a reception-ready signal by the receiver when preparatory conditions for receiving picture information have been established in the receiver on the basis of the group command signal and the phasing signal,

transmitting the picture information signal of document to be transmitted by the transmitter after the reception of the reception-ready signal,

recording the picture information as received by the receiver,

transmitting the end-of-message signal by the transmitter upon completed transmission of the picture information signal of the document,

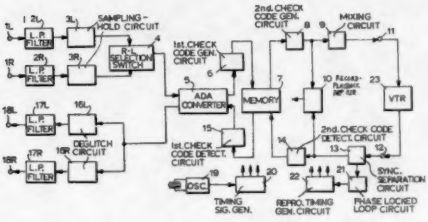
sending a message confirmation signal by the receiver after reception of the end-of-message signal,

wherein transmission of the picture information of a second document in succession to the picture information of the first document in the same transmitting mode, the transmission and the reception of at least the group identifying signal and the group command signal are omitted, which omission is previously informed to the receiver so that the receiver remains in the state ready for reception of the picture information of the second document, whereby the picture information of the second document as sent out from the transmitter is immediately received and recorded by the receiver.

4,274,115
APPARATUS FOR DETECTING RECORDING AND REPRODUCING STATE

Ryoichi Wada, Habikino; Takanori Senoo, Katano, and Kanji Odagi, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 9, 1979, Ser. No. 37,331
Claims priority, application Japan, May 12, 1978, 53-56917
Int. Cl.³ G11B *15/12, 27/36*
U.S. Cl. 360—62 **6 Claims**

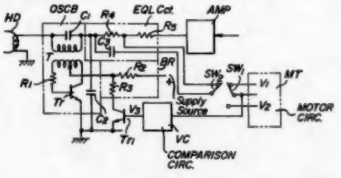


1. In a pulse code modulation adapter apparatus used with a video tape recorder for converting audio band signals to pulse code modulation codes used for recording and reproduction, an apparatus for detecting recording and reproducing state, comprising signal processing means for comparing for a predetermined period data from signals transmitted from the pulse code modulation adapter apparatus to the video tape recorder with data from the signals received by the pulse code modulation adapter apparatus from the video tape recorder, wherein the result of said data comparison is used for detecting whether the video tape recorder is in the recording or reproducing state.

4,274,116
TAPE RECORDER

Masatoshi Ida, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 25, 1978, Ser. No. 927,831
Claims priority, application Japan, Jul. 29, 1977, 52-91174
Int. Cl.³ G11B *5/45, 5/02*
U.S. Cl. 360—65 **9 Claims**

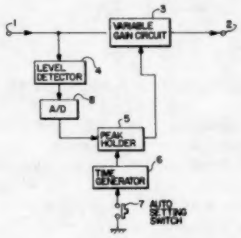


1. A tape recorder having a tape speed changing mechanism and comprising a magnetic recording and reproducing head, an oscillation circuit connected to the head, an equalizing circuit connected to the oscillation circuit, a biasing circuit connected to the oscillation circuit, a motor control circuit for setting a motor speed, a speed changing switch connected to the motor control circuit for changing the motor speed, a second switch interlocked with the speed changing switch, characterized in changing means for changing the bias of the biasing circuit in accordance with the position of the speed changing switch and for changing the frequency characteristics of the equalizing circuit in response to the second switch which is interlocked with the speed changing switch, said changing means including a transistor responsive to the position of said speed changing switch for grounding a portion of the current in said biasing circuit, said speed changing switch when in one position exhibiting one of the voltages in said motor control circuit and when in the other position exhibiting another voltage of said motor control circuit, said transistor responding to the voltage at said switch, a comparison circuit connected to the speed changing switch for sensing the voltage at the speed changing switch and connected to the transistor for varying the conductivity of the transistor.

4,274,117
DIGITAL RECORD LEVEL SETTING SYSTEM

Masao Tomita, Neyagawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 5, 1979, Ser. No. 91,498
Claims priority, application Japan, Nov. 6, 1978, 53-137108; Nov. 17, 1978, 53-142592
Int. Cl.³ G11B *5/02*
U.S. Cl. 360—68 **10 Claims**



1. A digital record level setting system comprising:
a variable gain circuit located within an input terminal and an output terminal;
a level detector which detects the level of the signal applied to said input terminal;
an A-D converter which converts to digital signal the analog voltage at said level detector;
an operation switch for setting the record level automatically;
a time generator of which the pulse width determines the period to search a maximum level of said level detector; and
a peak hold means which holds the maximum value of said digital signal during said pulse width at said pulse generator, whereby the amplitude of said input signal applied to said input terminal is controlled in accordance with digital signal from peak holder so as to respond to the maximum input level for a constant period.

4,274,118
SYSTEM FOR THE RECORDING AND PLAY-BACK OF VIDEO SIGNALS

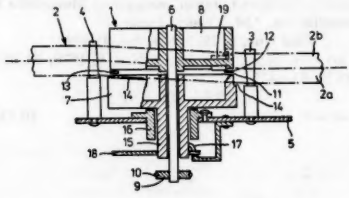
Hans Mangold, Fuerth, Fed. Rep. of Germany, assignor to Grundig E.M.V., Fed. Rep. of Germany

Filed Aug. 13, 1979, Ser. No. 65,875
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1979, 2847550
Int. Cl.³ G11B *5/08, 5/55, 5/56, 15/60*
U.S. Cl. 360—84 **5 Claims**

1. 1. In a system for the recording and playback of inclined track video signals wherein a length of magnetic tape is supported by guide means to extend partially about a head drum having at least one video head thereon, the improvement comprising:
said tape being divided longtiudinally with the slant tracks on one half the tape width being disposed to be recorded/played back when the tape is fed in one direction and the slant tracks on the other half of the tape width being disposed to be recorded/played back when the tape is fed in the opposite direction;

tape means for feeding said tape past said head and for automatically reversing the direction of feed of said tape when at least one end of said tape reached; and,

means for changing the relative position of said video head with respect to said tape when said tape feed means reverses direction whereby said video head is in operative position for the inclined tracks on one half the tape width when the tape travels in one direction and said video head is in operative position for the inclined tracks in the other



half of the tape width when the tape travels in the opposite direction,

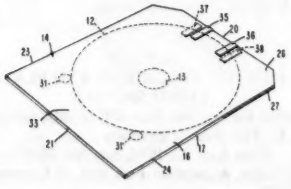
said position changing means including means for shifting said head drum in the direction perpendicular to the direction of travel of said tape and said head drum includes a first rotating portion supported on a second portion, said guide means includes a tape support extending helically about said second portion, and means for pivoting said second portion 180° each time said tape changes direction.

4,274,119

RECORDING DISK COVER AND PLAYER APPARATUS FOR REMOVING COVER

Curtis E. Hayward, Wappingers Falls, and Friedhelm Maurer, Poughquag, both of N.Y., assignors to Discovision Associates, Costa Mesa, Calif.

Filed Dec. 26, 1978, Ser. No. 973,421
Int. Cl.[3] G11B *5/012, 23/02, 25/04*
U.S. Cl. 360—97 **8 Claims**



1. A record cover for a video disk or the like comprising:

an upper part and a lower part of a non-magnetic material having a generally rectangular perimeter sealed together along a back edge, open along a front edge and sealed only along a part of each side edge to form separable front flaps, and

a first insert of a paramagnetic material carried by the flap of the upper cover part and extending rearwardly for a predetermined distance from the front edge of the flap,

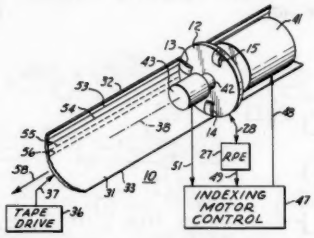
a second insert of paramagnetic material carried by the lower flap, the first and second inserts being laterally offset from each other.

4,274,120

INFORMATION RECORDING METHODS AND APPARATUS

Stewart E. Farnham, Mountain View, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Jan. 22, 1979, Ser. No. 5,539
Int. Cl.[3] G11B *5/54, 21/08*
U.S. Cl. 360—106 **15 Claims**



1. A method of recording information in several parallel tracks with a recording device on a recording tape having edges parallel to said tracks, comprising in combination the steps of:

curving said tape between said parallel edges;

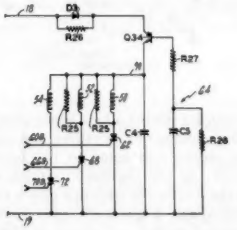
applying said recording device to said tape in information transducing relationship and recording information serially in said parallel tracks by moving said tape relative to said applied recording device in a direction parallel to said edges, selectively applying information to said recording device for recordation on said tape, restraining said recording device against any movement having a component extending away from either of said edges as long as an information recordation takes place in any of said tracks, and selectively releasing said restraint, between recordations in different tracks and incrementing said recording device angularly along the curvature of said curved tape from one to another of said different tracks.

4,274,121

TARGET CIRCUIT FOR CIRCUIT BREAKER STATIC TRIP UNIT

Edward K. Howell, Simsbury, Conn., assignor to General Electric Company, New York, N.Y.

Filed Jul. 31, 1979, Ser. No. 62,386
Int. Cl.[3] H02H *3/04*
U.S. Cl. 361—96 **15 Claims**



1. In a circuit breaker static trip unit having at least one current transformer for developing a secondary current proportional to a distribution circuit phase current flowing in its primary, a rectifier for rectifying the secondary current, a trip unit power supply connected with the rectifier for developing from the rectified secondary current a supply voltage across first and second buses to power the trip unit, a burden resistor

connected with the rectifier for developing a signal voltage proportional to the rectified secondary current, separate overcurrent trip mode networks for processing the signal voltage pursuant to developing a trip signal for triggering a thyristor into conduction to draw activating current from the trip unit power supply buses through a trip coil then operating to trip the circuit breaker, a target indicator circuit including, in combination:

A. a target;

B. a target thyristor electrically connected in series with said target between a third bus and the second trip unit supply bus;

C. a driver circuit electrically connected with said target thyristor and operable to trigger said target thyristor into conduction;

D. control means operating in conjunction with the tripping of the circuit breaker to activate said driver circuit to trigger said target thyristor into conduction; and

E. a target power supply including

(1) a storage capacitor connected between said third bus and the second trip unit supply bus,

(2) a transistor having an emitter-collector circuit connected between the first trip unit supply bus and said third bus, and a base-emitter junction, and

(3) an RC network connected between the first and second trip unit supply buses through said base-emitter junction;

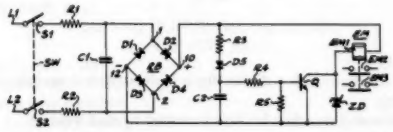
(4) whereby said storage capacitor is dynamically charged from the trip unit power supply through said emitter-collector circuit under the control of said RC network, and said storage capacitor discharging through said target when said target thyristor is triggered into conduction.

4,274,122

ENERGIZING AND QUICK DEENERGIZING CIRCUIT FOR ELECTROMAGNETIC CONTACTORS OR THE LIKE

James E. Hansen, Oak Creek, and Jerome G. Heinz, Milwaukee, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jun. 20, 1979, Ser. No. 50,482
Int. Cl.³ H01H *47/32*
U.S. Cl. 361—159 **6 Claims**



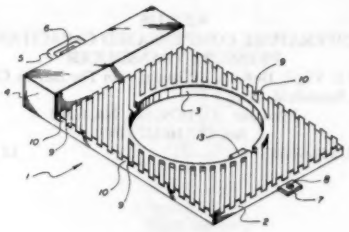
1. In combination, a full wave rectifier bridge having input terminals for connection to and disconnection from a source of alternating potential, an electromagnetic device having a control coil, and means including a first solid state device connected in circuit with the control coil of said electromagnetic device across the DC output terminals of said rectifier bridge for energizing said operating coil with unidirectional current only when AC potential is applied to the input terminals of said rectifier bridge and a second solid state device connected in parallel with the main current conducting circuit of said first solid state device which is rendered active when alternating potential to the rectifier bridge is disconnected to provide rapid discharge circuit for said control coil inclusive of portions of said rectifier bridge.

4,274,123

ANIMAL REPELLANT APPARATUS

Thurmond J. Rogers, Jr., 7245 Fairbanks, N. Houston, Houston, Tex. 77040

Filed Aug. 1, 1979, Ser. No. 62,722
Int. Cl.³ H05C *1/02*
U.S. Cl. 361—232 **10 Claims**



1. An animal repellant apparatus comprising

a flat mat of an insulating elastomeric material having at least one opening of a size and shape to receive a trash can,

an electric power source secured on said mat,

said mat having spaced ridges and grooves in the surface thereof,

a plurality of wires extending along the surface of at least some of said grooves, with at least part of said wires embedded partly in said surface and having their upper surfaces exposed and uninsulated,

means connecting alternate ones of said wires to one side of said power source, and

means connecting the remaining wires to the other side of said power source,

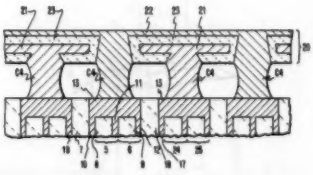
whereby an animal stepping on any two adjacent wires will be shocked and repelled, and whereby said grooves provide for drainage of water from said mat to prevent short circuiting said wires.

4,274,124

THICK FILM CAPACITOR HAVING VERY LOW INTERNAL INDUCTANCE

Irving Feinberg, Poughkeepsie, and Leon L. Wu, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 26, 1979, Ser. No. 106,640
Int. Cl.³ H01G *1/147*
U.S. Cl. 361—275 **6 Claims**



1. A capacitor comprising a multiplicity of closely spaced conductive plates,

some of said plates being connected to a first terminal, the remainder of said plates being connected to a second terminal, said terminals comprising first and second parallel levels of metal separated by a first dielectric layer, said first and second levels of metal extending in a direction perpendicular to the direction of said plates

said plates being spaced from each other by second dielectric layers, and

means for connecting said plates at the same ends thereof to respective ones of said terminals whereby the current of said capacitor flows in opposite spacial directions in the adjacent facing plates,

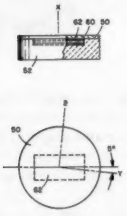
said means for connecting comprising a matrix of discrete connectors forming spaced parallel rows and spaced parallel columns at right angles to said rows.

4,274,125

TEMPERATURE COMPENSATED CAPACITANCE PRESSURE TRANSDUCER

Ronald F. Vogel, DeKalb, Ill., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jan. 23, 1979, Ser. No. 6,301
Int. Cl.³ H01G 7/00
U.S. Cl. 361—283 **12 Claims**



1. A pressure transducer comprising:

a crystalline deflection plate;

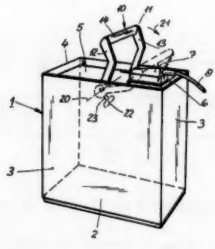
a clamping plate having a rectangular recess therein, said deflection plate and clamping plate being held together at least at the periphery thereof so that said deflection plate deflects into said recess in response to pressure difference thereacross, the crystallographic axes of said deflection plate being arranged with respect to the longitudinal axis of said recess to produce a quadradic transducer deflection versus temperature curve.

4,274,126

HOUSING FOR FLASH APPARATUS WITH AT LEAST ONE FLASH BULB SOCKET

Walter Haberthur-Heilig, Hofstetten/SO, Switzerland, assignor to Bron Elektronik AG, Allschwil bei Basel, Switzerland

Filed Dec. 20, 1978, Ser. No. 971,534
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1977, 7739045[U]
Int. Cl.³ H02B 1/08
U.S. Cl. 361—334 **6 Claims**



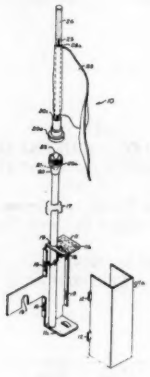
1. An accessory combination for a flash apparatus which includes: a housing that receives a condenser arranged therein with at least one socket having a plug-in opening and arranged on said housing for connection with flash tubes, an adjustable blocking device provided on said housing and including at least one adjustable blocking member movable into a blocking position for blocking said socket, and also including at least one movable control member adjustable together with said blocking member, and a network switch having a control pin arranged within the path of movement of said at least one movable control member, said blocking member and said control member assuring against unintended flashing and arcing in said socket, said network switch being a microswitch, said at least one movable control member comprising arm means pivotally mounted on said housing and having one end from which said blocking member projects at an angle of at least nearly 90°, said blocking member when in its blocking position being located above the plug-in opening of said socket covered thereby, said blocking member forming a U-shaped handle, said at least one movable control member simultaneously forming a control cam for said microswitch, said at least one movable control member of said blocking device being pivotable about an axis, and said at least one movable control member with regard to said axis in radial and circumferential direction being a cam disc, said adjustable blocking device comprising a yoke with two parallel arms having their free end sections pivotally supported by two oppositely located wall sections of said housing.

4,274,127

VEHICLE SAFETY ILLUMINATION DEVICE

Blaine E. Beck, Redfox Rd., Rt. 2, Camden, S.C. 29020, and Charles J. Corris, 2924 Aintree Dr., Columbia, S.C. 29206

Filed Jun. 9, 1976, Ser. No. 694,217
Int. Cl.² B62J 5/00
U.S. Cl. 362—72 **4 Claims**



1. An illumination device for a multi-wheeled venicle comprising:

a housing member for being carried by said vehicle;

said housing member constructed for receiving and containing a source of power;

a hollow pole member extending from said housing so as to extend generally vertically above a vehicle frame portion;

a translucent lamp housing carried by said pole at an upper end portion thereof substantially above said vehicle frame;

a lamp socket carried in a lower portion of said lamp housing for holding a lamp for emitting a light when operatively connected to said power source;

an elongated optic rod member carried by an upper portion of said lamp housing in light receiving relationship with light emitted by said lamp;

said rod member including a plurality of circumferentially spaced light transferring grooves, each said groove having a plurality of spaced serrations formed in an outer surface along the length thereof for transferring light

received from said lamp along the length of said rod member providing a solidly illuminated rod; and

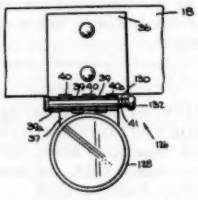
a frosted upper surface formed adjacent a remote end of said rod member for containing said light to illuminate said rod member substantially uniformly over its length providing an extended source of illumination having increased visibility.

4,274,128

FRICTION HINGED HEADLAMP OR THE LIKE

Leonard I. Malis, 219-44 Peck Ave., Hollis Hills, N.Y. 11423

Division of Ser. No. 901,486, May 1, 1978, Pat. No. 4,196,966.
This application Nov. 6, 1979, Ser. No. 91,717
Int. Cl.³ F21L *15/08;* **G02B** *27/02;* **A61B** *1/06;* **E05F** *1/12*
U.S. Cl. 362—105 **9 Claims**



1. A head-worn lamp suitable for placement on the head of a surgeon to provide illumination during surgical procedures which comprises a harness adapted to fit the head of the wearer including an annular band for encircling the head of the wearer, a generally cylindrical light projecting element, a fiber optical light cable having one end thereof connected to said light projecting element, a plate member fixedly attached to the front portion of said annular band and having at the lower end thereof a hinge member, a mating hinge member attached to a rearward location of said light projecting element, a pin member pivotally joining said hinge members to pivotally connect said light projecting element to said plate, and resilient means urging said hinge members into frinctional engagement to prevent pivotal movement of said light projecting element without the application of external force thereto, said pin being of a length greater than the length of the mated hinge members and said resilient means comprising a spring member disposed on said pin member at an end thereof extending beyond said hinge members.

4,274,129

NOVELTY PUMP LAMP

Garland A. Stevens, Silverhill, Ala., assignor to Huff-Ste., Inc., Silverhill, Ala.

Filed Nov. 19, 1979, Ser. No. 95,659
Int. Cl.³ F21V *33/00*
U.S. Cl. 362—109 **4 Claims**

1. A novelty lamp comprising:

(a) a base member;

(b) a pump housing rigidly secured to said base member;

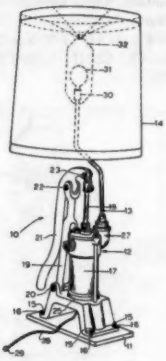
(c) a pump rod having a portion thereof extending above and vertically movable within said housing;

(d) a pump handle pivotally secured at one end to the top of said pump rod and having intermediate the length thereof a pivotal support on said housing;

(e) a light bulb, shade and support arrangement secured above and to a top portion of said housing and including a tubular support portion containing wiring for energizing said bulb;

(f) a switch mounted in an interior base portion of said housing and having a vertically positionable actuator in vertical alignment with said pump rod's path of vertical movement enabling the lower end of said pump rod to engage and be released from said actuator to control selective positioning of said switch; and

(g) an electrical supply cord having a wall outlet plug at one end and connected through said switch to said wiring connected to said bulb thereby enabling said bulb to be



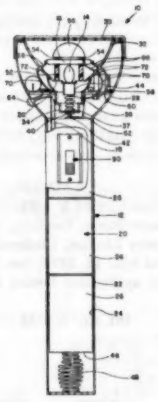
energized through circuitry established by positioning of said switch actuator through an up and down pump-like motion of said handle.

4,274,130

COMBINATION FLASHLIGHT AND HIGH INTENSITY LIGHT SOURCE

John B. Elliott, 410 Clarence La., Escondido, Calif. 92035

Filed Aug. 27, 1979, Ser. No. 69,871
Int. Cl.³ F21L *5/00, 15/02*
U.S. Cl. 362—184 **33 Claims**



1. A flashlight comprising:

a case,

a flashlight bulb, and a high intensity flash lamp in said case for transmitting light in the same direction from said case, and

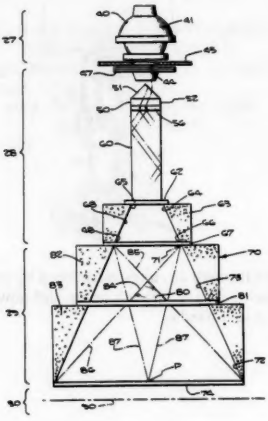
circuit means for selectively energizing said light bulb and flash lamp to continuously illuminate said bulb and flash said lamp, whereby said flashlight may be used to selectively illuminate a given area with continuous light from said bulb and illuminate the same area with high intensity light bursts from said lamp.

4,274,131

LIGHT DIFFUSING MEANS FOR A PHOTOGRAPHIC ENLARGER

Michael F. Praamsma, Santa Monica, Calif., assignor to Vivitar Corporation, Santa Monica, Calif.

Filed Jun. 14, 1979, Ser. No. 48,622
Int. Cl.³ G03B 27/54; F21V 11/00
U.S. Cl. 362—355 **9 Claims**



7. A light diffusing means comprising:

a diffuser body member having a light inlet opening, a light outlet opening, and an internal light reflecting chamber of frustoconical form expanding from said inlet opening to said outlet opening;

light transmitting and diffusing discs at said inlet and outlet light openings;

a transparent support means betweeen said inlet and outlet openings;

and means for increasing the amount of light intensity distributed in a radial direction at peripheral margins of the light outlet opening,

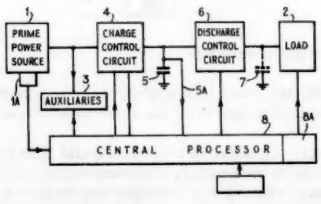
said means being supported from said transparent support means and arranged on the optical axis of said body member and spaced generally midway between said light inlet and outlet openings.

4,274,132

POWER SUPPLY ARRANGEMENTS

Robert B. Molyneux-Berry, Danbury, England, assignor to The Marconi Company Limited, Chelmsford, England

Filed Feb. 16, 1979, Ser. No. 12,727
Claims priority, application United Kingdom, Feb. 18, 1978, 6517/78
Int. Cl.³ H02M 3/335
U.S. Cl. 363—21 **10 Claims**



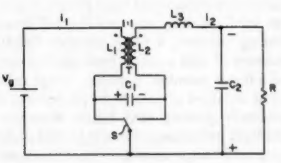
1. A power supply arrangement in which a power source is connected to supply a load which requires varying amounts of electrical power, and comprising reservoir storage means for receiving a variable level of electrical energy from said source, charge control circuit means connected between said reservoir storage means and said source for varying the level of electrical energy transferred to said storage means, discharge control circuit means connected between said storage means and the load for supplying the load with the varying amounts of electrical power required thereby, and processor means, having a first input connected to said source, a second input connected to said storage means, a first output connected to said charge control circuit means and a second output connected to said discharge control circuit means, and programmed to monitor the state of said power source to determine its capability for providing power to said reservoir storage means and to control said charge control circuit to achieve optimum charging thereof and to control said discharge control circuit to supply power to said load as required and consistent with the state of charge of said reservoir storage means and the capability of said power source.

4,274,133

DC-TO-DC CONVERTER HAVING REDUCED RIPPLE WITHOUT NEED FOR ADJUSTMENTS

Slobodan M. Cuk, Huntington Beach, and Robert D. Middlebrook, Pasadena, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Jun. 20, 1979, Ser. No. 50,179
Int. Cl.³ H02J 1/02
U.S. Cl. 363—39 **13 Claims**



1. In a switching dc-to-dc converter having: inductance in series with a voltage source to form an input circuit and in series with a load to form an output circuit, energy transfer capacitance coupling one terminal of said input circuit to a corresponding terminal of said output circuit; switching means for alternately connecting said capacitance to said input circuit in series to close a current path from the source back to the source and to said output circuit in series to close a current path from the load back to the load; and means for achieving unbalanced current ripple reduction in said input and output circuits without any adjustments required in circuit components after assembly.

4,274,134

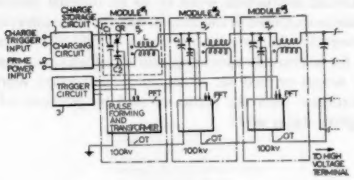
METHOD OF AND APPARATUS FOR HIGH VOLTAGE PULSE GENERATION

Paul R. Johannessen, Lexington, Mass., assignor to Megapulse Incorporated, Bedford, Mass.

Filed Apr. 9, 1979, Ser. No. 28,117
Int. Cl.³ H02M 3/18
U.S. Cl. 363—59 **18 Claims**

1. High voltage generator apparatus having, in combination, repetitively triggered charging circuit means; a plurality of successively connected similar pulse-generating modules connected with the charging circuit means and each comprising charge storage circuit means and pulse forming and transformer circuit means; trigger circuit means operable upon each charging of said charge storage circuit means of each module for thereupon triggering the transfer of the energy of such charging to the corresponding module pulse forming and transformer circuit means in order to form therein a stepped-up

high-voltage output pulse, with the said high-voltage output pulse of each module thereby occurring at substantially the same instant of time, producing a resultant high-voltage output pulse corresponding to the totality of the output pulses of the pulse forming and transformer circuit means of the plurality of modules; and means cooperative with the connections between



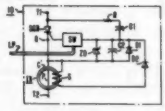
the successive modules for preventing the peak voltage within each module from exceeding the peak output voltage of the module independent of the position of the module in the plurality of modules, such that module failure results only in a reduction in the resultant output pulse power and enables continual operation even in the presence of such failure.

4,274,135

GATING CIRCUIT FOR HIGH VOLTAGE THYRISTOR STRINGS

John Rosa, and Laszlo Gyugyi, both of Penn Mills, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 26, 1979, Ser. No. 6,831
Int. Cl.³ H02M 7/00
U.S. Cl. 363—68 **16 Claims**



1. A current-actuated switch, comprising:

(a) switch means with main conducting terminals for interconnection with a circuit to be controlled by said switch means and with an actuating terminal for causing said switch means to conduct current at said main terminals thereof when said actuating terminal is energized with a predetermined value of energy;

(b) first electrical energizing means disposed in cooperation with a conductor in which electrical current flows, said first electrical energizing means having a first electrical energizing means output terminal which provides electrical energy in relation to said electrical current;

(c) second electrical energizing means disposed in cooperation with said main terminals of said switch means, said second electrical energizing means having a second electrical energizing means output terminal which provides electrical energy in relation to said voltage drop; and

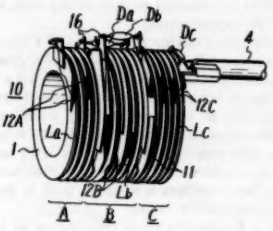
(d) energy storage means interconnected with said actuating terminal, said first electrical energizing means output terminal and said second electrical energizing means output terminal for storing energy which is provided to said energy storage means by either of said first or second electrical energizing means and for releasing energy of said predetermined value from said energy storage means for said actuating terminal at an appropriate time for causing said actuating switch means to conduct.

4,274,136

BOBBIN STRUCTURE FOR HIGH VOLTAGE TRANSFORMERS

Toshio Onodera, Kamakura, and Ken Tanimura, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 30, 1979, Ser. No. 71,198
Claims priority, application Japan, Sep. 1, 1978, 53-119951[U]; Sep. 1, 1978, 53-119952[U]; Oct. 20, 1978, 53-144831[U]
Int. Cl.³ H02M 7/00; H01F 27/30
U.S. Cl. 363—68 **6 Claims**



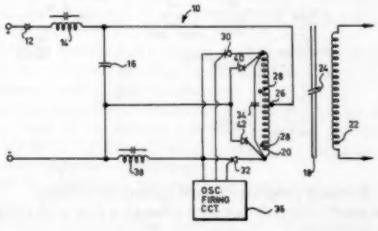
1. A fly-back transformer comprising a coil bobbin comprising a plurality of parallel spaced discs with a first adjacent plurality of said disc formed with delta shaped slots having first edges which extend tangentially to a first winding direction and a first winding wound on said first adjacent plurality of said discs in said first winding direction, a second adjacent plurality of said discs formed with delta shaped slots having first edges which extend tangentially to a second winding direction opposite said first winding direction and a second winding wound on said second adjacent plurality of said discs in said second winding direction, a third adjacent plurality of said discs formed with delta shaped slots having first edges which extend tangentially to said first winding direction and a third winding wound on said third adjacent plurality of said discs in said first winding direction and said second plurality of adjacent discs mounted between said first and third plurality of adjacent discs.

4,274,137

INVERTER CIRCUITS

Alfred M. Hase, 6 Manorwood Rd., Scarborough, Ontario, Canada

Filed Sep. 19, 1979, Ser. No. 76,859
Int. Cl.³ H02M 7/515
U.S. Cl. 363—139 **5 Claims**



1. In an inverter circuit having a direct current input and an alternating current output, the combination comprising:

(a) an input diode connected to said direct current source with its polarity arranged so as to be conductive under normal operation conditions of said inverter;

(b) an input filter choke in series with said direct current input and said input diode;
(c) a polarized capacitor across said direct current and said input diode and input choke, with the positive side of said capacitor facing the positive side of said direct current source;
(d) a pair of silicon controlled rectifiers facing in the same direction with respect to said direct current input, and an unpolarized commutation capacitor connected so as to be facing the side of each of said silicon controlled rectifiers which is remote from said direct current source;
(e) a drive circuit connected to the gates of said silicon controlled rectifiers so as to drive said silicon controlled rectifiers in a manner so that, at any time, one or the other of them is conductive;
(f) a transformer having a primary and a secondary winding, and a core with an air gap, where said primary winding is connected so that at any instant at least a portion thereof is in series with the silicon controlled rectifier which is conductive at that instant, and where said alternating current output is from said secondary winding;
(g) a commutation choke in series with said silicon controlled rectifiers and connected so that each of said silicon controlled rectifiers is in series with at least a portion of said commutation choke;
(h) and a feedback circuit comprising at least one diode arranged so as to be in counter-polarity to said polarized capacitor and connected to the opposite polarity side of said polarized capacitor at one side of said diode, and facing the primary winding of said transformer at the other side of said diode;

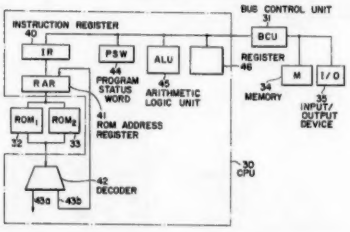
said inverter circuit thereby having fixed frequency, 180 electrical degrees direct current commutation, where the commutation is independent of the load conditions on said inverter; and having closed loop feedback which is electrically isolated from the load on said converter; and where said unpolarized commutation capacitor is a very low impedence capacitor; and said primary winding of said transformer is wound in such a manner as to substantially eliminate leakage flux.

4,274,138

STORED PROGRAM CONTROL SYSTEM WITH SWITCHING BETWEEN INSTRUCTION WORD SYSTEMS

Yoshiyuki Shimokawa, Hachioji, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Feb. 13, 1979, Ser. No. 11,912
Claims priority, application Japan, Jul. 31, 1976, 51-90847
Int. Cl.³ G06F 9/22
U.S. Cl. 364—200 **3 Claims**



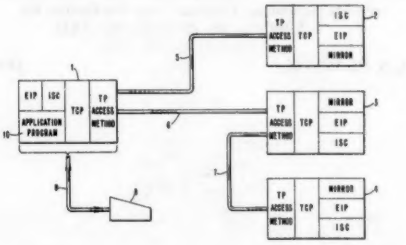
1. A stored program control system comprising:
an input/output device for exchanging data with an external apparatus,
a main memory device for storing data and instruction words including a set of universal instruction words and a set of sequence instruction words, said set of sequence instruction words containing a portion of said set of universal instruction words and,
a central processing unit including a plurality of general registers and means storing a program status word, said central processing unit controlling said input/output device and said main memory device, a portion of the bits of said program status word having a status representing selection of either said set of universal instruction words or said set of sequence instruction words, said central processing unit further including means responsive to a processed instruction word or to an internal processing sequence executed at the time of receipt of an interruption message for determining the status of said portion of bits and for selectively executing said set of universal instruction words or said set of sequence instruction words in accordance with the status of said bit portions of said program status word.

4,274,139

DIGITAL TELECOMMUNICATION NETWORK HAVING IMPROVED DATA PROCESSING SYSTEMS

Susan D. Hodgkinson, Winchester, and Peter Homan, Romsey, both of England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 16, 1979, Ser. No. 30,663
Claims priority, application United Kingdom, Jun. 15, 1978, 27003/78
Int. Cl.³ G06F 15/16
U.S. Cl. 364—200 **3 Claims**

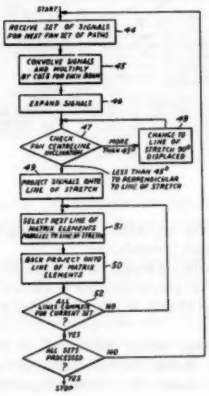


1. In a data processing system wherein a plurality of program-controlled data processing systems are interconnected as nodes in a telecommunication network, at least one of said nodes including an input/output device, and wherein each node of the network is capable of processing data according to resources associated with that node by setting up and executing a transaction process in response to each particular data processing request and any related requests presented thereto, the combination of:
means at each node of the system for determining when a local data processing request involves a transaction that requires the use of a resource held at another node of the system,
means at each node for transmitting the transaction request for the use of such a resource to the other node containing that resource,
means at each of said nodes for receiving transaction requests from other nodes in the system and for presenting each received transaction request to the data processing system at the receiving node in the same manner as though such request had originated locally at that node, thereby enabling the local data processing system to perform the transaction process associated with a request from another node as it would perform a transaction process associated with a like request originated at the local node, and
means at each of said nodes for transmitting the data resulting from said process to the requesting node.

4,274,140
ARRANGEMENTS FOR CONSTRUCTING REPRESENTATIONS OF PARTS OF BODIES

David M. Watson, 17, Latchmoor Way, Gerrards Cross, Buckinghamshire, England

Filed May 9, 1979, Ser. No. 37,530
Claims priority, application United Kingdom, May 12, 1978, 19149/78
Int. Cl.[3] G06F 15/42
U.S. Cl. 364—414 9 Claims



1. An apparatus for processing electrical signals derived from a computerized tomographic scanner and relating to attenuation suffered by X-radiation on traversing each of many substantially linear paths across a cross-sectional slice of a body under examination, said scanner supplying the signals in groups relating to sets of paths, the paths of each set diverging from a focus and the focus for each set being disposed at a different angular location relative to the cross-sectional slice and the signals in each group being supplemented as required by signals which are formed by interpolation between the first mentioned signals to represent attenuation for divergent paths not actually irradiated, the processing apparatus including a matrix store having a plurality of locations each of which is allocated to one of a plurality of elemental regions of the body, said elemental regions being disposed in a rectangular array in said slice; means for selecting and distributing to the locations of the matrix store contributions from the signals, both measured and interpolated, relating to path traversing the corresponding elemental regions of the body; the means for selecting and distributing including;

(a) a further store having a plurality of locations, representing a plurality of equally spaced positions on a line defined as being parallel to a plurality of parallel lines of the elemental regions,

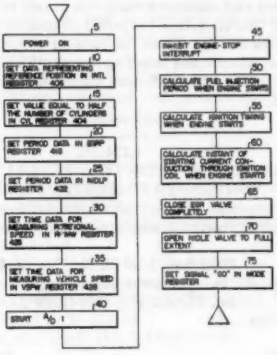
(b) means for distributing the contributions from the signals of a group to the locations of said further store, each location receiving that contribution relating to the path passing closest to the corresponding one of said spaced positions, and,

(c) means for distributing at least a part of the contribution in said location, of the further store, to locations of the matrix store, corresponding to elemental regions of the body intersecting a line joining the corresponding one of said spaced positions to the said focus.

4,274,141
METHOD AND APPARATUS FOR CONTROLLING AN INTERNAL COMBUSTION ENGINE, PARTICULARLY THE STARTING UP OF THE ENGINE

Hiroatsu Tokuda, Katsuta, and Toshio Furuhashi, Mito, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 18, 1978, Ser. No. 952,532
Claims priority, application Japan, Oct. 19, 1977, 52-125979
Int. Cl.[3] F02D 5/00; F02P 5/04; G05B 15/02
U.S. Cl. 364—431 68 Claims


POWER ON
5
SET DATA REPRESENTING PREFERENCE POSITION IN INTL REGISTER 405
10
SET VALUE EQUAL TO HALF THE NUMBER OF CYLINDERS IN CYL REGISTER 404
15
SET PERIOD DATA IN ESRP REGISTER 410
20
SET PERIOD DATA IN NIDLP REGISTER 420
25
SET TIME DATA FOR MEASURING ROTATIONAL SPEED IN N-SRW REGISTER 428
30
SET TIME DATA FOR MEASURING VEHICLE SPEED IN VSRW REGISTER 438
35
START
40
INHIBIT ENGINE-STOP INTERRUPT
45
CALCULATE FUEL INJECTION PERIOD WHEN ENGINE STARTS
50
CALCULATE IGNITION TIMING WHEN ENGINE STARTS
55
CALCULATE INSTANT OF ISSUING CURRENT CONDUCTION THROUGH IGNITION COIL WHEN ENGINE STARTS
60
CLOSE ESR VALVE COMPLETELY
65
OPEN IVDLE VALVE TO FULL EXTENT
70
SET SIGNAL "00" IN MODE REGISTER
75

1. In a method for controlling an internal combustion engine comprising

a step of detecting the operating conditions of said engine in the normal operation;

a step of calculating desired values representative of the desired operating conditions of said engine, on the basis of the detected operating conditions;

a step of setting said desired values in respective reference registers;

a step of successively comparing the content of selected one of instantaneous registers storing instantaneous conditions of said engine respectively corresponding to said desired values with said desired value set in the corresponding one of said reference registers; and

a step of supplying control signals to means for controlling the operation of said engine in accordance with the result of the each comparison so as to optimally control said engine,

said method further comprising, prior to said detecting step, the steps of:

starting a preset program in response to the turn on of the key switch,

setting in said reference registers desired initial values representing the desired operating conditions of said engine at the time of starting in accordance with said preset program, and

starting the operation of comparing one of said desired initial values with corresponding one of said instantaneous conditions of said engine successively.

7. In a microprocessor-controlled apparatus for controlling the operation of an internal combustion engine comprising means for detecting the operating conditions of said engine;

a control apparatus comprsing:

means for controlling the operating conditions of said engine;

a reference register group consisting of reference registers for respectively holding said desired values delivered from said microprocessor;

an instantaneous register group consisting of instantaneous registers for respectively holding the pieces of data repesenting the instantaneous conditions of said engine respectively corresponding to said desired values;

means for comparing successively the selected one of said

desired values in said reference registers with the corresponding one of said pieces of data representing said instantaneous conditions of said engine, held in said instantaneous registers and for supplying the results of the comparison as control signals to said means for controlling said operating conditions of said engine; and

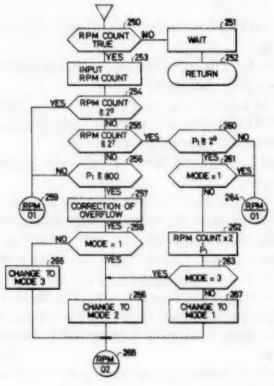
a selecting means for sequentially selecting one of said desired values in said reference registers in a predetermined order, simultaneously reading said instantaneous conditions selectively out of the corresponding instantaneous registers, and supplying the read conditions to said comparison means, and

wherein said microprocessor sets in said reference registers said desired values for initial control at the start of said engine in response to the turn on of the key switch and then actuates said selecting means after the completion of the setting of said desired values in said reference registers.

4,274,142
APPARATUS FOR DETECTING REVOLUTIONS OF AN INTERNAL COMBUSTION ENGINE

Toshio Furuhashi; Osamu Abe; Kotaro Hirasawa, and Masumi Imai, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 7, 1979, Ser. No. 64,431
Claims priority, application Japan, Aug. 7, 1978, 53-95482
Int. Cl.[3] G01P *3/488;* **G01R** *23/02*
U.S. Cl. 364—465 **37 Claims**



8. In an electronic control apparatus for detecting the speed of a first member moving relative to a second member comprising:

sensor means, coupled with said first and second members, for generating an output pulse for a prescribed displacement of said first and second members relative to each other;

a data processing unit for carrying out data processing operations and providing output data; and

an input/output unit coupled with said sensor means and said data processing unit;

said input/output unit comprising:

first means, coupled to said sensor means, for storing a first code, the value of which is modified in response to output pulses generated by said sensor means during a prescribed period of time; and

second means for controlling the duration of said prescribed period of time in response to output data provided by said data processing unit, said second means including

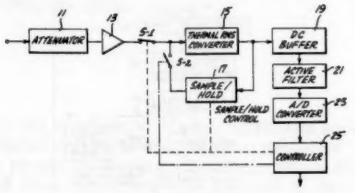
means for storing a second code, the value of which is modified of a preselected rate, and

means for generating an output signal, representative of said prescribed period of time during which the value of the first code stored by said first means is modified, in response to the value of said second reaching a predetermined value.

4,274,143
RECIRCULATING RMS AC CONVERSION METHOD AND APPARATUS

Benjamin T. Brodie, and Henriecus Koeman, both of Edmonds, Wash., assignors to John Fluke Mfg. Co., Inc., Mountlake Terrace, Wash.

Filed Aug. 2, 1979, Ser. No. 62,923
Int. Cl.[3] G01R *15/10*
U.S. Cl. 364—483 **21 Claims**



7. Apparatus for accurately determining the RMS value of an unknown signal comprising:

(a) RMS conversion means having a relatively smooth transfer curve for converting an unknown signal into a DC signal proportional to the RMS value of the unknown signal;

(b) recirculating means connected to the output of said conversion means for recirculating the output of said conversion means back to the input of said conversion means;

(c) control means connected to said RMS conversion means and said recirculating means for controlling the application of signals to said RMS conversion means such that an input unknown signal and the output of said recirculating means are sequentially applied to said RMS conversion means; and,

(d) combining means connected to said RMS conversion means for receiving the outputs of said RMS conversion means produced when said input unknown signal and the output of said recirculating means are sequentially applied to said RMS conversion means and combining said outputs in accordance with the relationship $2Y_1 - Y_2$ to accurately determine the RMS value of the unknown signal, where Y_1 is directly related to the output produced by said RMS conversion means when said input unknown signal is applied to said RMS conversion means Y_2 is directly related to the output produced by said RMS conversion means when said output of said recirculating means is applied to said RMS conversion means.

4,274,144
FUEL CONTROL SYSTEM DEVELOPMENT APPARATUS

Paul M. Meyer, East Alton; Robert H. Beckwith, Elsah, both of Ill.; Richard D. Allman, Bridgeton, and Mark Jefferis, Webster Groves, both of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

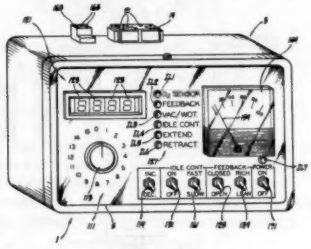
Filed Dec. 31, 1979, Ser. No. 108,496
Int. Cl.[3] G06F *15/20;* **G01M** *15/00*
U.S. Cl. 364—551 **16 Claims**

1. Apparatus for use in developing and testing a control system for an internal combustion automobile engine, the system utilizing electromechanical devices attached to a carburetor mounted on the engine, sensors for sensing various engine operating parameters and electrical circuitry including a programmable memory having a plurality of addresses for controlling operation of the devices in response to inputs from the sensors, the apparatus comprising:

a housing locatable about the automobile in a location where it can be visually observed by an operator of the automobile, the electrical circuitry being installed in the housing;

a wiring harness for interconnecting the sensors and the electromechanical devices with the electrical circuitry;

means for selectably accessing an address in the memory, different addresses in the memory containing information relating to different aspects of the system;



means for changing the information stored in a selected memory address and thereby the operating characteristics of the system;

means for visually displaying the contents stored in a selected address so an operator of the system can visually verify the information stored therein; and

means for visually monitoring operation of the system while the engine is running thereby to determine system performance during road tests, performance of the system thus being observable under actual driving conditions.

4,274,145

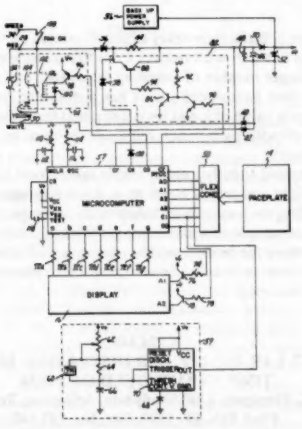
DIGITAL THERMOSTAT

Donald B. Hendricks, Bloomington, and Robert M. Knight, Greenwood, both of Minn., assignors to MicroComm Corporation, Minneapolis, Minn.

Filed Dec. 31, 1979, Ser. No. 108,342

Int. Cl.³ G06F *15/20;* G05D *23/00;* F23N *5/20*

U.S. Cl. 364—557 **23 Claims**



1. A programmable temperature control apparatus for providing control signals for controlling temperature during a sequence of time intervals, the apparatus comprising:

temperature sensing means for providing a temperature signal indicative of a sensed temperature;

a plurality of heat registers for storing a plurality of time values and associated control temperature values;

a time-of-day register for storing a time-of-day value;

a heat set key for selecting one of the heat registers, recalling the contents of the heat registers, and altering the stored time values, the heat set key having a non-actuated and a user-actuated state;

a plurality of temperature keys for altering the stored temperature values, each key having a non-actuated and user-actuated state and being representative of a predetermined range of temperature values;

display means;

means responsive to the heat set key and the plurality of temperature keys for controlling the display means and the heat registers;

means for providing the control signals as a function of the temperature signal, the time and control temperature values, and the time-of-day value.

4,274,146

CALENDAR DATA DISPLAY DEVICE FOR AN ELECTRONIC DEVICE

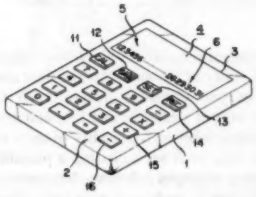
Mikio Yanagawa, Akishima, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Jun. 1, 1979, Ser. No. 44,631

Claims priority, application Japan, Jun. 12, 1978, 53-70506; Jun. 14, 1978, 53-71801; Jun. 16, 1978, 53-72934; Jun. 21, 1978, 53-74077; Aug. 28, 1978, 53-104662

Int. Cl.³ G06F *15/02;* G04B *19/24*

U.S. Cl. 364—705 **35 Claims**



1. A calendar data display device for an electronic device, comprising:

display means including a numerical data display section for displaying various numerical data and a calendar display section for forming a calendar showing a desired arrangement of the dates of at least one month;

display drive means connected to said display means for driving said display means;

input means including: at least one calendar designating unit for generating a signal instructing that data for forming a calendar of a desired month be supplied to said display drive means; and at least one date data designating unit for generating a signal instructing that data displayed by said numerical data display section is preset;

control means connected to said input means for generating, in response to the output signal of said at least one calendar designating unit, a control signal instructing that the calendar of the desired month is formed;

calendar preparation means connected to said control means for preparing the calendar of the desired month under control of said control means and connected to said display drive means for supplying said display drive means with signals corresponding to the calendar prepared, said prepared calendar being formed by using the data representing the date corresponding to a specific day of the week and/or another data; and

memory means connected to said calendar preparation means and/or said input means for storing the data for forming the calendar of the desired month and/or date

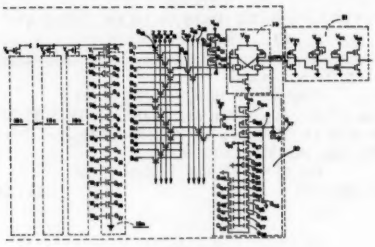
data which are to be read out upon actuation of said input means and to be displayed by said display means.

4,274,147

STATIC READ ONLY MEMORY

Clarence W. Padgett, Westminster; Melvin L. Marmet, Corona, and Mark R. Tennyson, Anaheim, all of Calif., assignors to Rockwell International Corporation, El Dequndo, Calif.

Filed Sep. 4, 1979, Ser. No. 72,383
Int. Cl.³ G11C *7/00, 7/06*
U.S. Cl. 365—189 **10 Claims**



1. In combination with an electronic memory of the type having a plurality of substantially identical memory cells each composed of one transistor device, each transistor device including a control electrode and first and second conduction path electrodes, wherein a plurality of such memory cells are arranged in sets, each set including a plurality of input rows and a plurality of output columns, the control electrode of the transistor devices in each input row being formed in common, and the first conduction path electrodes of the transistor devices within each output column being connected in electrical series to the second conduction path electrode of adjacent transistor devices in each output column, so that a control electrode-controlled series conduction path is established through each output column of transistor devices in each set:

means connecting each corresponding input row in a group of said sets of memory cells to form common input lines;

means connecting each of said output columns in a group to form a single common bit line, each of said bit lines in a group being connected to a single common group output line;

a source of relatively positive and a source of relatively negative potential, said source of relatively positive potential being selectively connectable with said single common group output line so as to be connectable with one end of said series conduction path through each output column of transistors, the other end of said series conduction path being connected to said source of relatively negative potential;

a sense amplifier having a first input selectively connectable with said single common group output line by first and second series connected MOS field effect transistors, and a second input; and

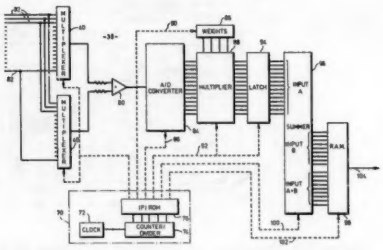
a tracking reference voltage circuit connected to one of said inputs of said sense amplifier, said voltage reference comprising a series circuit of field effect transistors having a first end terminal, an intermediate terminal, and a second end terminal connected to ground.

4,274,148

DIGITAL TIME-DELAY BEAMFORMER FOR SONAR SYSTEMS

Adrian van't Hullenaar, deceased, late of Smithville, Canada (by Christina Maria van't Hullenaar, executrix), assignor to Westinghouse Canada Limited, Hamilton, Canada

Filed Aug. 29, 1979, Ser. No. 70,686
Claims priority, application Canada, Sep. 8, 1978, 310882
Int. Cl.³ G01S *3/80*
U.S. Cl. 367—122 **3 Claims**



1. An interleaved method of sampling a multi-element symmetrical array in order to form a beam related to one or more directional elements wherein the total number of samples to be taken is given as:

$$Z = Mn$$

where M is the total number of beams to be formed and n is the number of sample-sets desired to form any beam m, said method comprising the steps of:

(A) sampling each i element symmetrically disposed to the left and right of the one or more directional elements for beam m during each consecutive sampling interval z where i is defined as $o \leqq i \leqq n-1$, z is defined as $o \leqq z \leqq Z$, and m is given by:

$$m = \text{Remainder}\left[\frac{\frac{z-di}{n}+M}{M}\right]+1$$

where di is the time delay of the i^{th} sample to the right and left of beam m with respect to its first sample expressed as an integer number of sampling intervals z and di is chosen such that Remainder [di/n] has a different integer value for each value of i, and i is determined from the remainder of di divided by n which remainder is equal to the remainder [z/r];

(B) summing together each sample taken from i elements to the right and left of beam m to form a sample-set;

(C) adding each sample-set taken to its corresponding partial sum of sample-sets and storing the partial sum; and

(D) forming the beam from the partial sum of sample-sets for each beam when the beam's respective sample-sets have been summed.

4,274,149

BINOCULAR DEVICE FOR DISPLAYING ELAPSED TIME IN THE FIELD OF VIEW

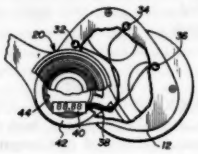
Charles E. Flanagan, 2208 Shadydale, Arlington, Tex. 76012

Filed Feb. 19, 1980, Ser. No. 117,647
Int. Cl.³ G04B *47/00*; G02B *27/14*
U.S. Cl. 368—10 **28 Claims**

1. Apparatus for providing a superimposed readout of digital information onto the field of view in binoculars, comprising:

(a) binoculars, including a housing having two generally co-extensive barrels;

(b) a chronometer device for measuring elapsed time, with said device being mounted in the binocular housing and including a digital display for displaying the information generated by a time-keeping portion of said chronometer device, and said digital display being positioned within the



binocular housing so as to be visible and in focus when a user places the binocular housing adjacent his eyes for viewing something within his field of view; and

(c) switch means mounted on said binocular housing for controlling operation of said chronometer device.

4,274,150

ELECTRONIC WATCH

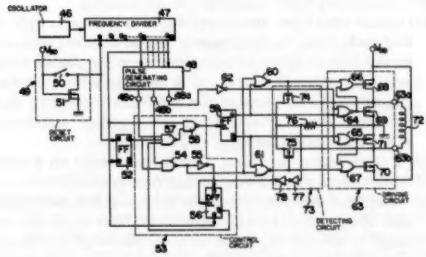
Masataka Ikenishi; Joichi Miyazaki; Shozo Kushida; Hiromasa Nakanishi; Makoto Ueda, and Masaharu Shida, all of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Jun. 27, 1978, Ser. No. 919,611

Claims priority, application Japan, Jun. 28, 1977, 52/77314

Int. Cl.[3] G04B *17/12*

U.S. Cl. 368—185 **5 Claims**



1. An electronic timepiece, comprising: an oscillator circuit for generating an oscillatory time standard signal; a divider circuit receptive of the oscillatory time standard signal for generating a plurality of repetitive pulse output signals having different respective frequencies; pulse generating means receptive of the pulse output signals from said divider circuit for generating a detecting pulse signal, a reversing pulse signal and a reference pulse signal having predetermined relative timings determined by the pulse output signals from said divider circuit; a stepping motor having a rotor and a coil for receiving electrical driving pulses; a drive circuit responsive to a control signal for applying electrical driving pulses having polarities determined by the control signal for rotating said stepping motor rotor; control circuit means responsive to output pulses from said pulse generating means and having a normal operating mode for applying to said drive circuit the control signal effective to control said drive circuit to apply alternate polarity electrical drive pulse to said stepping motor coil to rotate said stepping motor rotor in a normal direction; mechanical display means driven by said stepping motor for displaying time, said mechanical display means including a time-indicating hand which changes position to indicate the value of a unit of time; reset circuit means including a manually operable switch for resetting said divider circuit to correct the time kept by the timepiece; means actuated by said manually operable switch for stopping said time-indicating hand at one of a plurality of spaced predetermined positions when said divider circuit is reset by said reset circuit means; and rotor position detecting means for detecting whether said stepping motor is in a position to rotate in response to a forthcoming electrical drive pulse after said divider circuit has been reset by said reset circuit means and for generating and applying an electrical signal to said control circuit means which indicates whether or not said stepping motor rotor is in a position to rotate, and said control circuit means being responsive to the electrical signal generated by said rotor position detecting means for applying a driving pulse having a polarity effective to rotate said stepping motor rotor after said divider circuit has been reset.

4,274,151

ELECTRONIC WATCH HAVING AN ALARM FUNCTION AND A GLOBAL TIME DISPLAY FUNCTION

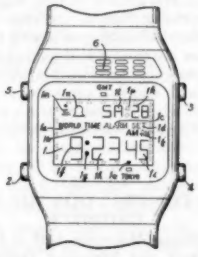
Osamu Kamiwaki, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Dec. 3, 1979, Ser. No. 99,689

Claims priority, application Japan, Dec. 4, 1978, 53-150181

Int. Cl.[3] G04B *19/22, 23/02*

U.S. Cl. 368—21 **12 Claims**



1. An electronic watch for use in a plurality of globel time zones, com,rising:

signal-generating and signal-dividing means for generating standard signals for time data;

display means for selectively displaying time data for any of said plurality of global time zones;

means for selecting any one of said plurality of time zones for display of corresponding time data;

means for setting a global alarm time for any selected one of said plurality of time zones;

alarm function means for attracting a user's attention, said alarm function means triggering when the displayed time coincides with said global-set alarm time; and

means for coincidentally changing the global-set alarm time by an amount corresponding to the time difference between zones when the time zone for display is changed by operation of said means for selecting time zones,

whereby said alarm function means is triggered upon the occurrence in the time zone where said alarm time is set of the global-set alarm time, regardless of the zone of the time data selected for current display.

4,274,152

SETTING MECHANISM OF A WATCH

Toshimasa Ikegami, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Apr. 19, 1979, Ser. No. 31,689

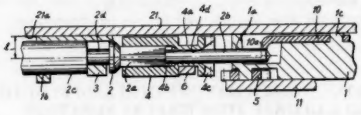
Claims priority, application Japan, Apr. 19, 1978, 53-51653[U]

Int. Cl.[3] G04B *27/04, 19/24, 29/00, 19/20*

U.S. Cl. 368—192 **19 Claims**

1. A setting mechanism of a watch comprising a dial plate, a

winding stem interior to said dial plate and essentially parallel thereto, frame plate means for supporting said winding stem for rotation and for axial translation, clutch wheel means coaxially mounted on said stem and movable therewith, and a member actuatable in response to axial movement of said clutch wheel means, a first portion of said winding stem within said clutch wheel having a first cross-section for mating with said clutch wheel means for rotating said clutch wheel means with rotation of said winding stem and moving said clutch wheel means in an axial direction, said clutch wheel means having an



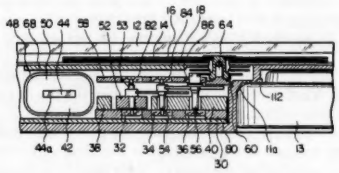
engaging annular groove around the outside surface thereof for engaging therein said member and moving said member in said axial direction, said groove being in registry with a second portion of said winding stem within said clutch wheel, said second portion of said winding stem having a second cross-section, the maximum distance in said second cross-section from the stem axis of rotation to said clutch wheel being less than the maximum distance in said first cross-section from said axis to said clutch wheel, whereby said groove can extend inwardly closer to said axis and the watch can be thinner.

4,274,153

MOVEMENT CONSTRUCTION FOR ELECTRONIC TIMEPIECE

Kazunari Kume; Minoru Watanabe, both of Tokorozawa; Hideshi Ohno, Sayama, and Munetaka Tamaru, Tokyo, all of Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 787,410, Apr. 14, 1977, abandoned. This application Oct. 4, 1978, Ser. No. 948,591
Claims priority, application Japan, Apr. 30, 1976, 51-49544
Int. Cl.[3] G04B *19/04*
U.S. Cl. 368—80 **15 Claims**



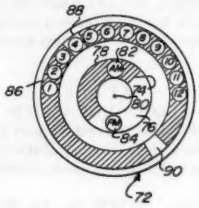
1. A movement structure for an electronic timepiece having a stepping motor and time indicating hands driven by said stepping motor, comprising:
a time dial;
a wheel train bridge disposed in spaced relationship with respect to said time dial;
a base plate spaced from said wheel train bridge;
a rotor forming part of said stepping motor and rotatably supported between said wheel train bridge and said base plate, said rotor having a rotor pinion;
a first reduction gear rotatably supported between said wheel train bridge and said base plate, said first reduction gear meshing said rotor pinion of said rotor and having a pinion;
a second reduction gear disposed between said wheel train bridge and said base plate and meshing said pinion of said first reduction gear, said second reduction gear being mounted on a shaft having its lower end provided with a reduction gear pinion directly and rotatably supported by said wheel train bridge;
a center wheel disposed between said wheel train bridge and said time dial and meshing said reduction gear pinion of said second reduction gear, said center wheel driving said indicating hands.

4,274,154

LUMINOUS CLOCK DISPLAY USING OPTICAL FIBERS

A. S. Dostoomian, and Alan C. Traub, both of Canton, Mass., assignors to Vanzetti Infrared & Computer Systems, Inc., Canton, Mass.

Filed Mar. 14, 1980, Ser. No. 130,291
Int. Cl.[3] G04C *19/00*
U.S. Cl. 368—82 **8 Claims**



1. A clock having a luminous display, comprising:
(a) an enclosed housing having a display face visible at one side thereof;
(b) a stationary light source within the housing;
(c) optical fiber light conductors disposed to receive light at first ends from the light source and to conduct such received light to pre-determined points on the display face, said first ends being arranged in patterns within annular concentric bands, each of the bands corresponding to a different time period from the group consisting A.M./P.M., hours, minutes and seconds;
(d) a clock motor providing a rotational output on a shaft corresponding to the longest said time periods;
(e) an opaque disc attached to the shaft to rotate therewith, said opaque disc having transparent filter windows located in annular segments of said disc, said disc being positioned between the light source and the concentric bands of light conductor ends, so that light is blocked to the first ends within a concentric band except where a filter window is aligned with and between the light source and the first ends.

4,274,155

MULTIPORT CONFERENCE CIRCUIT WITH MULTI-FRAME SUMMING AND VOICE LEVEL CODING

Tim Funderburk, Villa Park, and Donald W. McLaughlin, Naperville, both of Ill., assignors to GTE Automatic Electric Laboratories Inc., Northlake, Ill.

Filed Aug. 6, 1979, Ser. No. 64,201
Int. Cl.[3] H04J *3/02;* **H04M** *3/56*
U.S. Cl. 370—62 **8 Claims**

1. In a pulse code modulated (PCM) communication system,
a plurality of communication channels arranged on a multiplexed basis,
a switching system including a memory, a memory access for said communication channels and a conference circuit arrangement including,
a first register connected to said memory and operated to store the pulse code modulated value of information from

each of said channels conducted sequentially through said memory,

a voice level coding means connected to said first register responsive to said information to output a code value representative of the voice level of said information, above an established threshold level,

a second register connected to said first register and including an output circuit,

a conferee sum storage means including an output circuit,

binary adder means having a first input means connected to said coding means and a second input means connected to said first and said second inputs to provide an output,

a third register connected to receive said output of said binary adder means and including an output circiut,

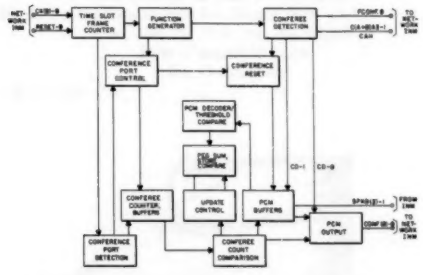
a first comparator circuit connected to said binary adder means and to said third register output circuit and operated to compare said outputs and in response to a determination that the value of information stored in said binary adder means is less than the value of information stored in said third register to provide a first output signal,

said third register operated in response to said first comparator circuit first output signal to store said binary adder means output,

first counting means connected to said memory and periodically incremented in reponse to signals from said memory,

a fourth register connected to said counting means and arranged to store the count of said counting means,

a fifth register connected to said fourth register,



a second comparator circuit connected to said counting means and fifth register(s) and operated in response to a determination that the count stored in said counting means and fifth register(s) are equal to provide an output signal,

a second counting means connected to said memory and operated to count the number of sequences of said memory to provide an output signal upon the passage of a predetermined number of sequences,

and means responsive to said second counting means output signal to operate said fifth register to accept the count stored in said fourth register,

a sixth register connected to the output of said second register and having an output to said switching system and operated in response to said signal from said second counting means for transfer of said pulse code modulated value of information from said second register to said channels under control of said switching system,

and gating control means connected to said first and second comparator circuits and selectively operated in response thereto to provide an update signal,

said update signal coupled to said conferee sum storage means to operate it to accept the pulse code modulated value of information from said binary adder means for storage therein, said update signal further being coupled to said fourth register to operate the latter to transfer the count in said counting means into storage in said fourth register.

4,274,156

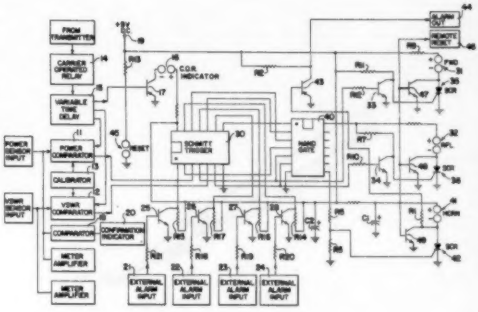
MONITOR FOR RF TRANSMITTER

Ralph P. Trefney, Valley View, Ohio, assignor to Bird Electronic Corporation, Solon, Ohio

Filed Jan. 18, 1978, Ser. No. 870,340

Int. Cl.[3] H04B *1/04, 17/00*

U.S. Cl. 455—115 **1 Claim**



1. A device for monitoring operating conditions of an RF transmitter having an output carrier wave, said operating conditions including the RF power output and reflected voltage wave thereof, and for promptly switching off said transmitter when a faulty condition is detected, comprising:

first comparator means comprising solid state circuit elements for comparing an input voltage signal representative of said RF power output with a predetermined reference voltage and for generating a first output signal when said voltage signal varies a predetermined amount from said predetermined reference voltage,

second comparator means comprising solid state circuit elements for comparing another input voltage signal representative of said reflected voltage wave with another predetermined reference voltage and for generating a second output signal when said other voltage signal varies a predetermined amount from said predetermined reference voltage,

relay means operated by the output carrier wave of said transmitter for activating said first and second comparator means,

time delay means operatively associated with said relay means so that said first and second comparator means are actuated only when said transmitter is switched on and has reached a normal operating condition,

a Schmitt trigger for conditioning said output voltage signals from said comparators to provide uniform steady voltage signals for transmission therefrom;

a NAND gate adapted to receive a plurality of voltage signals from said Schmitt trigger, including voltage signals representative of said output signals from said comparators, and to output an alarm signal voltage whenever at least one voltage signal is received whereby said alarm signal voltage may be used to switch off said transmitter.

259,520

CAP

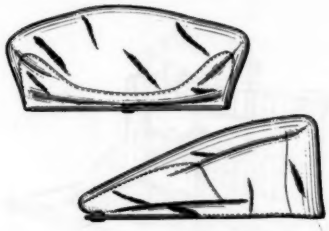
Milton Rappaport, New York, N.Y., assignor to Vendome Headwear Inc., New York, N.Y.

Filed Mar. 2, 1979, Ser. No. 16,858

Term of patent 14 years

Int. Cl. D02—*03*

U.S. Cl. D2—244



259,521

ICE SKATING BOOT WARMER

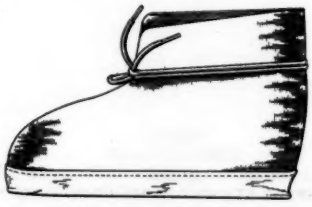
Joy L. Barr, 3 Triphammer La., Ithaca, N.Y. 14850

Filed Jun. 21, 1979, Ser. No. 51,288

Term of patent 14 years

Int. Cl. D2—*04*

U.S. Cl. D2—272



259,522

BABY SHOE

Pierre Bidegain, Pau, France, assignor to Bidegain S.A., Pau, France

Filed Feb. 6, 1979, Ser. No. 9,810

Claims priority, application France, Nov. 21, 1978, 78 855

Term of patent 14 years

Int. Cl. D2—*04*

U.S. Cl. D2—278

259,523

CROCHET TOOL

M. Almeda Hopper, 19265 Mallory Canyon Rd., Salinas, Calif. 93907

Filed Jul. 30, 1979, Ser. No. 62,143

Term of patent 14 years

Int. Cl. D2—*07*

U.S. Cl. D3—28

259,524

TAMBOUR JEWELRY BOX

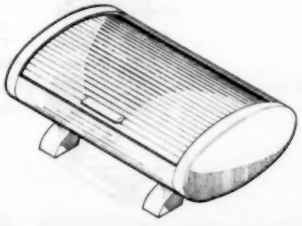
Bruce Erdman, 300 W. Main St., Mt. Horeb, Wis. 53572

Filed Jul. 19, 1979, Ser. No. 59,126

Term of patent 14 years

Int. Cl. D3—*01*

U.S. Cl. D3—75



259,525

COMBINED TABLE AND UMBRELLA

Shirley Kane, 108 Fairlane Dr., Joliet, Ill. 60435

Filed Jan. 22, 1979, Ser. No. 5,611
Term of patent 14 years
Int. Cl. D6—*05*
U.S. Cl. D6—4

259,526

COMBINATION TENNIS RACKET AND HAND GRIP MATERIAL DISPLAY STAND

Larry L. Ralston, Jr., Cabarrus Country Club P.O. Box 281, Weddington Rd., Concord, N.C. 28025

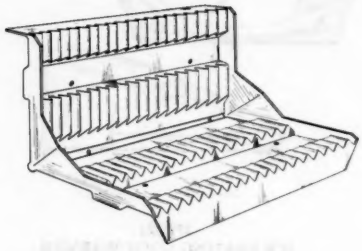
Filed Nov. 23, 1979, Ser. No. 96,786
Term of patent 14 years
Int. Cl. D20—*02;* D21—*02*
U.S. Cl. D6—23

259,527

STACKABLE TRAY OR SIMILAR ARTICLE

Dominic R. Bartholomew, Jr., Fountain Valley, and Albert R. Waltz, Fullerton, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 10, 1978, Ser. No. 949,489
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—114



259,528

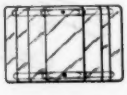
DISPLAY STAND FOR MERCHANDISE

Robert Crane, Piscataway, and Seymour Mayerson, Somerset, both of N.J., assignors to Burlington Industries, Inc., Greensboro, N.C.

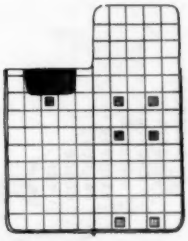
Filed Jan. 16, 1979, Ser. No. 3,933
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—157

259,529
STAND FOR PLANTS OR FLOWERS
Walter T. Kola, 1418 Highland Ave., Joliet, Ill. 60435
Continuation of Ser. No. 922,088, Jul. 5, 1978, abandoned. This application Oct. 17, 1978, Ser. No. 952,121
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—179

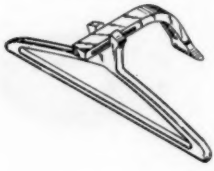
259,530
PLANT LADDER
Edward S. Korzon, Beacon Falls, Conn., assignor to Dura Plastics of New York, Bridgeport, Conn.
Filed Jul. 18, 1979, Ser. No. 58,618
Term of patent 14 years
Int. Cl. D6—*06, 99*
U.S. Cl. D6—183



259,531
CLOSEABLE WEATHERPROOF BLANKET FOR CHILDREN
Thomas D. Prouty, 3860 Ballantrae Rd., Eagan, Minn. 55122, and Bruce A. Smith, Lions Field, Charles City, Iowa 50616
Filed Jun. 26, 1978, Ser. No. 919,403
Term of patent 14 years
Int. Cl. D6—*09;* D2—*99*
U.S. Cl. D6—201

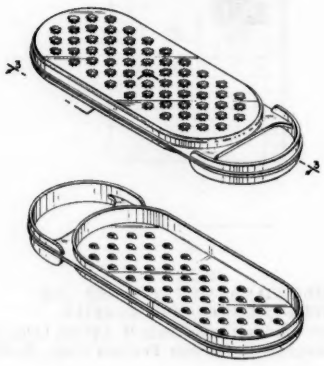


259,532
COMBINED GARMENT HANGER AND OVER-THE-SHOULDER CARRIER
Walter E. Steele, Braintree, and George W. Upham, Lynn, both of Mass., assignors to Heritage Products Corp., Reading, Mass.
Filed Jan. 2, 1979, Ser. No. 289
Term of patent 14 years
Int. Cl. D6—*08;* D8—*08*
U.S. Cl. D6—249

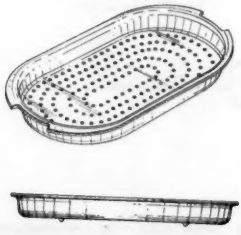


259,533
SPOON STRAW
Vaughn D. Frodsham, Tustin, Calif., assignor to Howard L. Huntington, Anaheim, Calif., a part interest
Filed Aug. 31, 1978, Ser. No. 938,428
Term of patent 14 years
Int. Cl. D07—*06*
U.S. Cl. D7—42

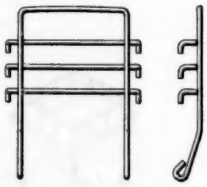
259,534
GRATER OR THE LIKE
Robert H. C. M. Daenen, Hekelgem, and Pieter K. J. De Coster, Aalst, both of Belgium, assignors to Dart Industries Inc., Los Angeles, Calif.
Filed Mar. 12, 1979, Ser. No. 19,963
Term of patent 14 years
Int. Cl. D07—*04*
U.S. Cl. D7—47



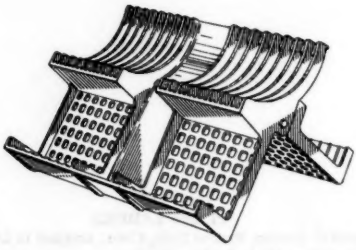
259,535
COLANDER OR THE LIKE
Robert H. C. M. Daenen, Hekelgem, Belgium, assignor to Dart Industries Inc., Los Angeles, Calif.
Filed May 3, 1979, Ser. No. 35,571
Term of patent 14 years
Int. Cl. D07—*04*
U.S. Cl. D7—47



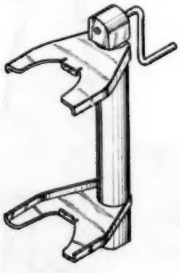
259,536
HEIGHT ADJUSTMENT MEANS FOR SELECTIVE SPACING BETWEEN CIRCULAR COOKING GRILL AND HANGING FIRE GRATE
Fred O. Douglas, Columbus, Ga., assignor to W. C. Bradley Co., Columbus, Ga.
Filed Nov. 24, 1978, Ser. No. 963,455
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—129



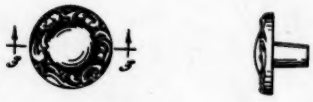
259,537
FOLDING DISH DRAINER
William D. Taylor, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Jan. 12, 1979, Ser. No. 3,007
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—188



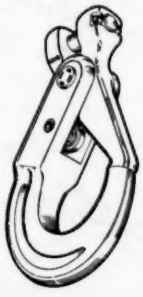
259,538
SPRING-COMPRESSING TOOL
B. David Bowling, 14846 Acton Dr., San Jose, Calif. 95124
Filed Jun. 2, 1977, Ser. No. 802,669
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—59



259,539
KNOB
Teresa R. B. Pittenger, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed Dec. 21, 1979, Ser. No. 106,236
The portion of the term of this patent subsequent to Apr. 3, 1993, has been disclaimed.
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—310



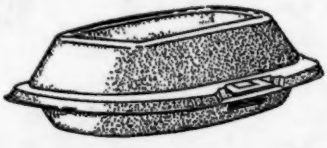
259,540
SAFETY HOOK
Stig Svensson, Ramnas, Sweden, assignor to Bulten-Kanthal AB, Hallstahammar, Sweden
Filed Jun. 15, 1978, Ser. No. 915,944
Claims priority, application Sweden, Jan. 25, 1978, 780208
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—367



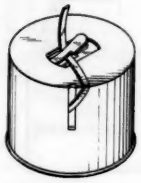
259,541
FLUID DISPENSER
Jack Halbeisen; Peter A. Basile, both of Hudson, and Carl E. Bochmann, Brecksville, all of Ohio, assignors to The Clorox Company, Oakland, Calif.
Filed Jul. 21, 1978, Ser. No. 927,110
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—300

259,542
BOTTLE OR SIMILAR ARTICLE
Vincent M. Shortino, Independence, Mo., assignor to Ethyl Development Corporation, Baton Rouge, La.
Filed Dec. 19, 1977, Ser. No. 862,238
The portion of the term of this patent subsequent to Apr. 8, 1994, has been disclaimed.
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—403

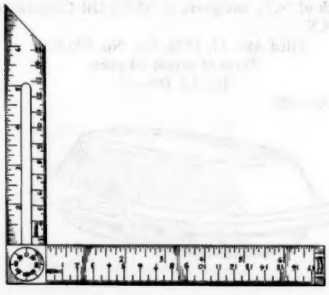
259,543
COVERED CONTAINER OR THE LIKE
Nicholas D. Commisso, Victor, and Dwight O. Palmer, Rochester, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.
Filed Apr. 17, 1978, Ser. No. 896,875
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—426



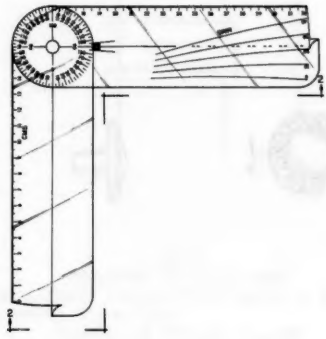
259,544
TWIST TIE DISPENSING PACKAGE
Anton Haagedoorn, Bedford, and Philip Merlin, Spring Valley, both of N.Y., assignors to A.L.A. Industries, Inc., Harrison, N.Y.
Filed Mar. 16, 1979, Ser. No. 21,240
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—419



259,545
MULTI-RULE
Ulric M. Rocheleau, 135 Pearl St., St. Albans, Vt. 05478
Filed Nov. 1, 1978, Ser. No. 956,633
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—65

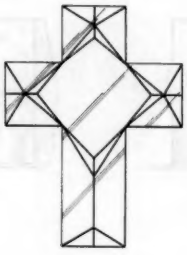


259,546
DESIGN FOR COMBINED RULER AND MAGNIFYING CALIPER
Morris Simon, 8 Otis Pl., Beacon Hill, Boston, Mass. 02108
Filed Feb. 21, 1979, Ser. No. 13,053
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—65

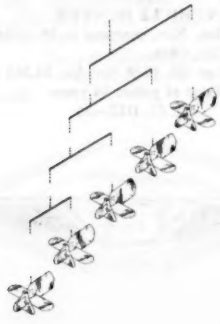


259,547
PEN RING
Genaro Texidor, 522 W. 136th St., New York, N.Y. 10031
Filed Jun. 11, 1979, Ser. No. 47,487
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—2

259,548
DIAMOND
Benayahu L. Najjar, 104-20 Queens Blvd., Forest Hills, N.Y. 11375
Filed Nov. 2, 1978, Ser. No. 957,239
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—90



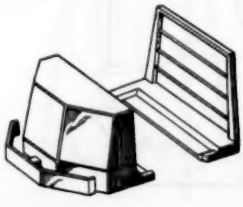
259,549
MOBILE
Andre Jacobs, 24 rue Fernand Neuray, Ixelles, Belgium
Filed Sep. 20, 1978, Ser. No. 943,985
Term of patent 3½ years
Int. Cl. D11—*02*
U.S. Cl. D11—141



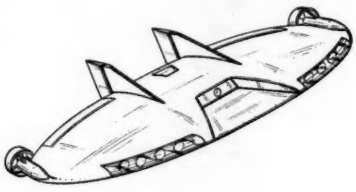
259,550
HORSEMAN FIGURE
Charles A. MacLean, 23073 Beech, Dearborn, Mich. 48124
Filed Apr. 27, 1979, Ser. No. 33,871
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—159

259,551
TELEVISION SUPPORT STAND OR SIMILAR ARTICLE
Lloyd L. Oatman, 8830 E. Calle Bogota, Tucson, Ariz. 85715
Filed Jan. 25, 1979, Ser. No. 6,273
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—25

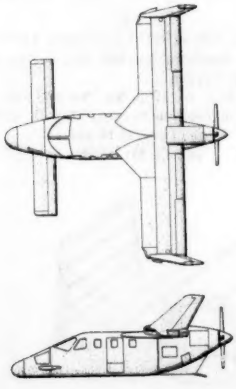
259,552
REMOTE CONTROLLED FORK TRUCK
Olof H. Lindfors, Goteborg, Sweden, assignor to Aktiebolaget Volvo, Goteborg, Sweden
Filed Nov. 24, 1978, Ser. No. 963,569
Claims priority, application Sweden, May 25, 1978, 781359
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—57



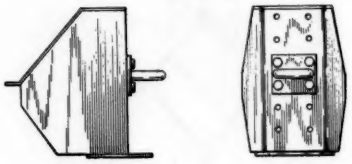
259,553
SUBMARINE
Richard T. Robinson, Los Angeles, Calif., assignor to August G. Carloni, Los Angeles, Calif.
Filed Jun. 22, 1978, Ser. No. 918,285
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—308



259,554
AIRCRAFT
Carl Parise, 1990 Pheasant La., Reno, Nev. 89509, and Lawrence K. Heuberger, 10605 Whitehawk La., Reno, Nev. 89506
Filed Jul. 5, 1978, Ser. No. 922,143
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—332



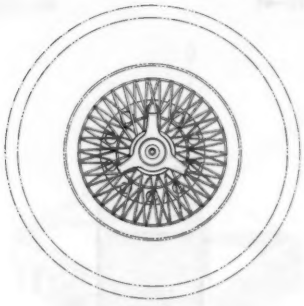
259,555
TRAILER HITCH
Edward J. Lazzeroni, Racine, Wis., assignor to Miller Tilt-Top Trailer, Inc., Milwaukee, Wis.
Filed Sep. 29, 1978, Ser. No. 947,245
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—162



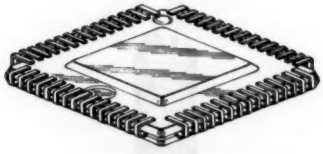
259,556
VEHICLE BUMPER
Carl V. Norris, Fallon, Nev., assignor to Metalfab Industries, Inc., Oklahoma City, Okla.
Filed Feb. 12, 1979, Ser. No. 11,317
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—169

259,557
VEHICLE BUMPER
Carl V. Norris, Fallon, Nev., assignor to Metalfab Industries, Inc., Oklahoma City, Okla.
Filed Apr. 30, 1979, Ser. No. 34,363
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—169

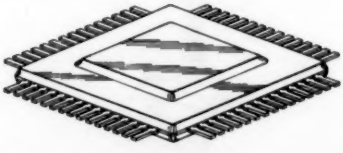
259,558
WIRE WHEEL CENTER FOR A TRUCK
Lee Simpson, 220 Clovis Ave., Apt. 102, Clovis, Calif. 93706
Filed Feb. 21, 1979, Ser. No. 13,620
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—205



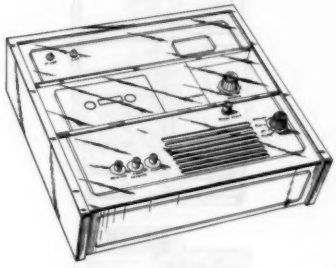
259,559
SEMICONDUCTOR
Hidetoshi Mochizuki, Fuchu; Keizo Otsuki, Higashiyamato; Hideki Kosaka, Kodaira, and Gen Murakami, Machida, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jan. 24, 1979, Ser. No. 6,199
Claims priority, application Japan, Jul. 28, 1978, 53-31692
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—99



259,560
SEMICONDUCTOR
Hidetoshi Mochizuki, Fuchu; Keizo Otsuki, Higashiyamato; Hideki Kosaka, Kodaira, and Gen Murakami, Machida, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jan. 24, 1979, Ser. No. 6,200
Claims priority, application Japan, Jul. 28, 1978, 53-31689; Jul. 28, 1978, 53-31690; Jul. 28, 1978, 53-31691; Jul. 28, 1978, 53-31697; Jul. 28, 1978, 53-31698
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—99



259,561
TELEPHONE ANSWERING MACHINE
Elliot I. Baum, Dix Hills, N.Y., assignor to Quasar Microsystems, Inc., Brentwood, N.Y.
Filed Jan. 8, 1979, Ser. No. 1,922
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—4



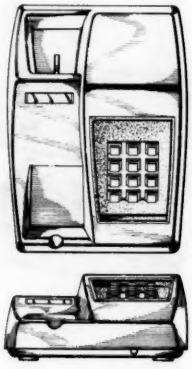
259,562
SPEAKER STAND
Darrell A. Schoenig, 432 Clover La., Ft. Collins, Colo. 80521
Filed Sep. 25, 1978, Ser. No. 945,338
Term of patent 14 years
Int. Cl. D14—*99*
U.S. Cl. D14—38

259,563

TELEPHONE INSTRUMENT STAND

Anthony M. Marshall, 30 Lakeshore Rd., Apt. 1009, Pointe Claire, Quebec, Canada

Filed Jul. 14, 1978, Ser. No. 924,870
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—60

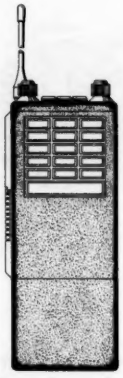


259,564

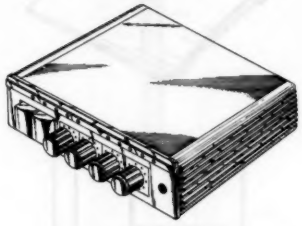
PORTABLE RADIO TRANSMITTER AND RECEIVER HOUSING

Robert R. Huntington, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Aug. 28, 1978, Ser. No. 937,492
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—68



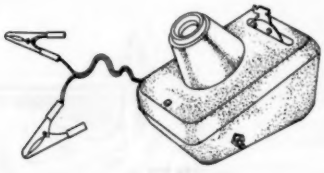
259,565
MOUNTED AMPLIFIER
Ikuo Watanabe, Tokyo, Japan, assignor to Godo Kigyo Co., Ltd., Tokyo, Japan
Filed Apr. 3, 1978, Ser. No. 893,169
Claims priority, application Japan, Dec. 21, 1977, 52-50186
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—96



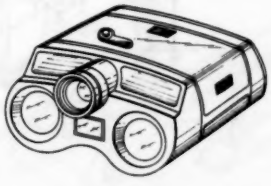
259,566
CARPET EXTRACTOR
Paul E. Phillips, Whitehall, Mich., assignor to Clarke-Gravely Corporation, Muskegon, Mich.
Filed Mar. 28, 1979, Ser. No. 24,541
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—49

259,567
CARBONATING MACHINE FOR DRINKS
Kenneth Grange, London, England, assignor to Kenwood Cascade Company Limited, Havant, England
Filed Feb. 9, 1979, Ser. No. 10,802
Claims priority, application United Kingdom, Aug. 15, 1978, 985932/78
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—112

259,568
PLUG CLEANER
Kendall Swenson, Torrance, Calif., assignor to Orion Industries, Inc., Compton, Calif.
Filed Dec. 8, 1978, Ser. No. 967,710
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—125

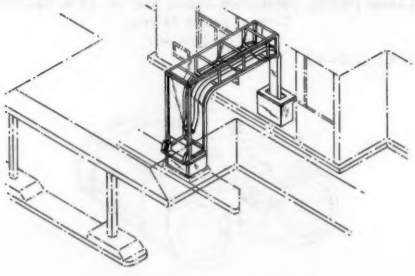


259,569
COMBINED CAMERA AND BINOCULARS
Shigeo Nishioka, Tokyo, Japan, assignor to J. Gerber and Co., (Japan) Ltd., Tokyo, Japan
Filed Nov. 27, 1978, Ser. No. 964,107
Claims priority, application Japan, May 30, 1978, 53-21951
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—01

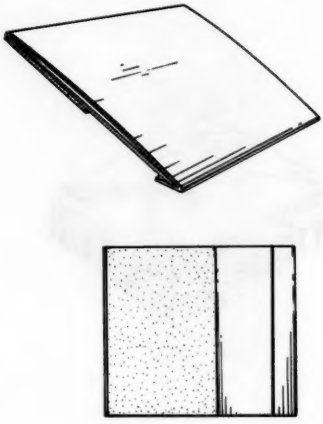


259,570
STRINGED INSTRUMENT HEAD
Masao Hoshino, Aichi, Japan, assignor to Hishino Gakki Ten, Inc., Nagoya, Japan
Filed Jun. 8, 1978, Ser. No. 914,232
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—20

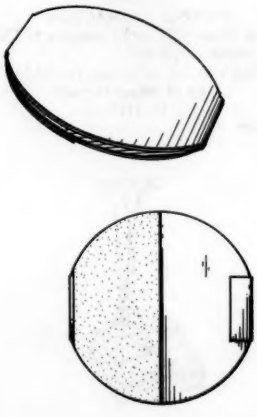
259,571
REMOTE SERVICE CONVEYOR UNIT
Stanley J. Arasim, Jr., West Milford, and Edward J. Voitas, Mahwah, both of N.J., assignors to The Mosler Safe Company, New York, N.Y.
Filed Sep. 14, 1978, Ser. No. 942,223
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D18—35



259,572
GREETING CARD
Jean-Claude Renaud, 10725 Verville St., Montreal, Canada (H3L 3G1)
Filed Sep. 18, 1978, Ser. No. 943,414
Term of patent 14 years
Int. Cl. D19—*05*
U.S. Cl. D19—1



259,573
GREETING CARD
Jean-Claude Renaud, 10725 Verville St., Montreal, Canada (H3L 3G1)
Filed Sep. 18, 1978, Ser. No. 943,520
Term of patent 14 years
Int. Cl. D19—*05*
U.S. Cl. D19—1



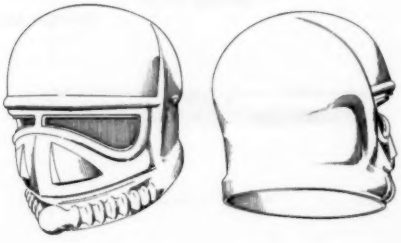
259,574
CASING FOR A WRITING INSTRUMENT
Olof V. Anderson, North Kingstown, R.I., assignor to Anson Incorporated, Providence, R.I.
Filed Jul. 13, 1978, Ser. No. 924,451
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—48

259,575
HANDLE FOR A TOY ARTICLE OF FLATWARE
Larry R. Nagode, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Jan. 14, 1980, Ser. No. 111,541
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—109

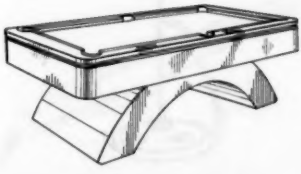
259,576
TOY TELEPHONE
Joseph J. Clement, 1220 DeNarvaez Ave., Bradenton, Fla. 33505
Filed Oct. 13, 1978, Ser. No. 951,287
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—111

259,577
TOY FOOTBALL PLAYER FIGURE
Armando Baeza, 5543 Westmont Rd., Whitter, Calif. 90601
Filed Feb. 26, 1979, Ser. No. 15,109
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D21—177

259,578
TOY HELMET
Ronald Carreiro, 28 Sargent Rd., South Weymouth, Mass. 02190
Filed Dec. 11, 1978, Ser. No. 968,395
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—190



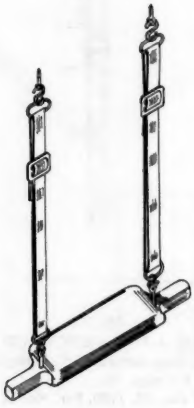
259,579
POOL TABLE
Arnold Kaye, Westport, Conn., assignor to Irving Kaye Company, Inc., Stamford, Conn.
Filed Jul. 30, 1979, Ser. No. 61,649
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—232



259,580
POOL TABLE
Arnold Kaye, Westport, Conn., assignor to Irving Kaye Company, Inc., Stamford, Conn.
Filed Jul. 30, 1979, Ser. No. 61,817
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—232

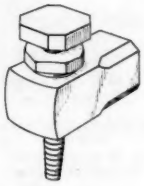
259,581
MAGNETIC TOY
Eric H. Kretschmer, 2210 Wilshire Blvd., #146, Santa Monica. Calif. 90403
Filed Mar. 5, 1979, Ser. No. 17,713
Term of patent 14 years
Int. Cl. D11—*02;* D21—*01*
U.S. Cl. D21—240

259,582
SWING
Amon Aquarian, 1127 Alapapa St., P.O. Box 1394, Kailua, Hi. 96734
Filed Jul. 25, 1979, Ser. No. 60,381
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D21—246

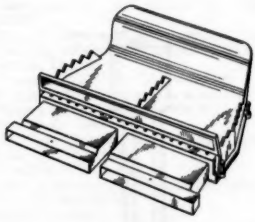


259,583
INSECT ELECTROCUTER
Dennis L. Mulee, 304 Samoset La., Schaumburg, Ill. 60193
Filed Aug. 17, 1979, Ser. No. 68,003
Term of patent 14 years
Int. Cl. D22—*06*
U.S. Cl. D22—19

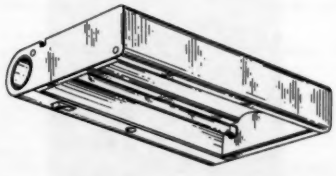
259,584
VALVE
Charles D. Riley, Durham, and Charles G. Waddell, Hillsborough, both of N.C., assignors to Hydro Service & Supplies, Inc., Durham, N.C.
Filed Jul. 24, 1978, Ser. No. 927,711
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19



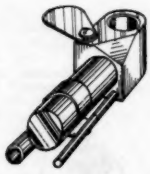
259,585
FIREPLACE HEAT EXCHANGER
Thomas V. Metz, Portland, and W. James Sirois, Beaverton, both of Oreg., assignors to Pacific Fireplace Furnishings, Inc., Portland, Oreg.
Filed Dec. 7, 1978, Ser. No. 967,377
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—95



259,586
TASK LIGHT FIXTURE
Dennis E. Johnson, Grafton, Wis., assignor to McGraw-Edison Company, Rolling Meadows, Ill.
Filed Feb. 26, 1979, Ser. No. 15,415
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—76

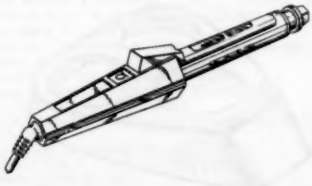


259,587
SMOKING PIPE
Philip E. Jergenson, Berkeley, Calif., assignor to Proto Plant Inc., Willits, Calif.
Filed Jan. 8, 1979, Ser. No. 1,968
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—03



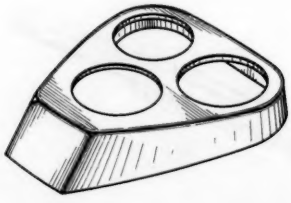
259,588
LIGHTER
Franz A. Stutzer, Muhlheim, Fed. Rep. of Germany, assignor to Rowenta-Werke GmbH, Offenbach am Main, Fed. Rep. of Germany
Filed Oct. 12, 1978, Ser. No. 950,764
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1978, 510095
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—42

259,589
HAIR STYLER
Bing-Yiu Chin, Tsuen Wan, Hong Kong, assignor to Goodway Manufacturing Limited, New Territories, Hong Kong
Filed Dec. 8, 1978, Ser. No. 967,754
Claims priority, application United Kingdom, Jun. 14, 1978, 985033/78
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—35



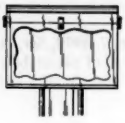
259,590
ELECTRIC DRY SHAVER
Knut O. Yran, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Oct. 6, 1978, Ser. No. 949,302
Claims priority, application United Kingdom, Aug. 8, 1978, 985834/78
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—50

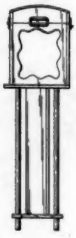
259,591
SHAVING CUTTER HOLDER
Knut O. Yran, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Oct. 6, 1978, Ser. No. 949,303
Claims priority, application United Kingdom, Apr. 11, 1978, 984174/78
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—50



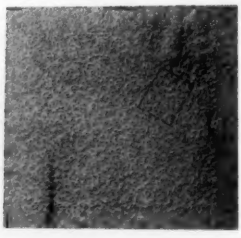
259,592
FLEXIBLE LINK FASTENER FOR HORSE BLANKETS OR THE LIKE
Albert E. Ostermaier, 4710 Sunnyslope Ave., Sherman Oaks, Calif. 91403
Filed Nov. 20, 1978, Ser. No. 962,356
Term of patent 14 years
Int. Cl. D30—*01*
U.S. Cl. D30—37

259,593
COMBINED AQUARIUM COVER AND STAND
David A. Gross, 267 Reed Ave., Marion, Ohio 43302
Filed Oct. 1, 1979, Ser. No. 80,463
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—10





259,594
MBOSSED PLASTIC SHEET MATERIAL
Weitzman, Toledo, Ohio, assignor to Owens-Corning s Corporation, Toledo, Ohio
Filed Apr. 25, 1979, Ser. No. 33,271
Term of patent 14 years
Int. Cl. D5—*06*
U.S. Cl. D92—1.1



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 16TH DAY OF JUNE, 1981

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Osakeyhtio: *See—*
Niskanen, Toivo, 4,273,562, Cl. 55-52.000.

A/S Niro Atomizer: *See—*
Rasmussen, Elisabeth L., 4,273,747, Cl. 423-210.000.

A. und K. Muller GmbH & Co. KG: *See—*
Moldenhauer, Hermann; and Muller, Kurt, 4,273,154, Cl. 137-490.000.

AB Volvo: *See—*
Holmer, Heinz E. A., 4,273,084, Cl. 123-179.00L.

Abbott Laboratories: *See—*
Haviv, Fortuna; and Carter, George W., 4,273,940, Cl. 564-372.000.
Ling, Chung-Mei; Decker, Richard H.; and Chairez, Ruben, 4,273,756, Cl. 424-1.000.
Martin, Jerry R.; Tadanier, John S.; and Collum, Paulette, 4,273,924, Cl. 536-17.00R.
Martin, Jerry R.; Tadanier, John S.; and Johnson, Paulette, 4,273,925, Cl. 536-17.00R.
Voss, Houston F.; Plattner, Jacob; and Herrin, Thomas R., 4,273,866, Cl. 435-7.000.

Abe, Osamu: *See—*
Furuhashi, Toshio; Abe, Osamu; Hirasawa, Kotaro; and Imai, Masumi, 4,274,142, Cl. 364-465.000.

Abel, Heinz, to Ciba-Geigy Corporation. Process for dyeing textile cellulose material which has not been pre-cleaned. 4,273,554, Cl. 8-557.000.

Abreu, Mario E.: *See—*
Hoffman, Jacob S.; and Abreu, Mario E., 4,272,955, Cl. 60-39.360.

ACF Industries, Incorporated: *See—*
Byrnes, Thomas J., Jr., 4,273,730, Cl. 261-41.00D.
Meyer, Paul M.; Beckwith, Robert H.; Allman, Richard D.; and Jefferis, Mark, 4,274,144, Cl. 364-551.000.
Morrison, Bertram L., 4,273,309, Cl. 251-174.000.

Acker, G. Marts: *See—*
Smith, Lawrence M.; and Acker, G. Marts, 4,273,281, Cl. 227-152.000.

Adin, Anthony, to Eastman Kodak Company. Inhibition of image formation utilizing cobalt(III) complexes. 4,273,860, Cl. 430-338.000.

AFA Corporation, The: *See—*
Quinn, David R., 4,273,290, Cl. 239-493.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See—*
Roux, Jacques, 4,273,491, Cl. 414-109.000.

AGFA Gevaert, A.G.: *See—*
Borowski, Kurt; Wagensonner, Eduard; and Cocron, Istvan, 4,273,428, Cl. 354-23.00D.

AGFA-GEVAERT N.V.: *See—*
Jaeken, Jan; Verhecken, Andre; Vetter, Hans; and Marx, Paul, 4,273,855, Cl. 430-242.000.

Air Products and Chemicals, Inc.: *See—*
Hollely, David J. E.; and Shepherd, Norris W., 4,273,294, Cl. 241-18.000.

Aisan Industry Co., Ltd.: *See—*
Arai, Hisaharu, 4,273,656, Cl. 210-448.000.

Ajinomoto Co., Inc.: *See—*
Nagashima, Tetsuya; Usuba, Yasunori; Ogawa, Takahisa; and Takehara, Masahiro, 4,273,684, Cl. 252-544.000.

Akado, Hajime: *See—*
Sugie, Hiromichi; Akado, Hajime; and Yamashita, Akira, 4,273,564, Cl. 55-267.000.

Akashi, Goro; Yamada, Yasuyuki; Fujiyama, Masaaki; and Yamaguchi, Nobutaka, to Fuji Photo Film Co., Ltd. Method of detecting pinholes in a magnetic recording medium. 4,273,797, Cl. 427-10.000.

Akashi, Kageyasu: *See—*
Hayashi, Yoshio; Matsui, Takeki; Shiga, Tetsuo; Akashi, Kageyasu; Akiyama, Minoru; and Kimura, Takeo, 4,273,723, Cl. 260-414.000.

Aki, Fumitake: *See—*
Kamiya, Hiroyuki; Watanabe, Seiji; Taniguchi, Masatosi; Okawara, Tomokichi; Aki, Fumitake; and Wachi, Yasuyuki, 4,274,021, Cl. 310-54.000.

Akiba, Shigeyuki: *See—*
Yamamoto, Takaya; Sakai, Kazuo; and Akiba, Shigeyuki, 4,274,103, Cl. 357-13.000.

Akiyama, Minoru: *See—*
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Aktiebolaget Karlstads Mekaniska Werkstad: *See—*
Pehrsson, Anders L., 4,273,545, Cl. 440-75.000.

Aladiev, Ivan T.; Dzhamardzhashvili, Vazha A.; Dikhashidze, Manana A.; Teplov, Sergei V.; and Tskhvirashvili, David G. Liquid-metal magnetohydrodynamic converter. 4,274,019, Cl. 310-11.000.

Alexander, David L.: *See—*
Barber, Everett M.; Muenger, James R.; and Alexander, David L., 4,273,743, Cl. 422-148.000.

Alexander, Robert R.: *See—*
Lester, David; and Alexander, Robert R., 4,273,145, Cl. 132-1.00R.

Alexander, Ronald R. Tonneau cover apparatus for pickup truck vehicles. 4,273,377, Cl. 296-100.000.

Aley, Michael H.; Bowen, James A.; and Glass, Cecil A., to United States of America, Navy. Surface-launched fuel-air explosive minefield clearance round. 4,273,048, Cl. 102-363.000.

Alferness, Rodney C., to Bell Telephone Laboratories, Incorporated. Optical wavelength filter. 4,273,411, Cl. 350-96.140.

Allen, Richard C., to Hoechst-Roussel Pharmaceuticals, Inc. Method of reducing gastric secretion. 4,273,772, Cl. 424-248.540.

Allied Chemical Corporation: *See—*
Frankila, John W., 4,273,301, Cl. 242-107.200.
Novotny, Miroslav, 4,273,947, Cl. 568-842.000.

Allinikov, Sidney, to United States of America, Air Force. Fluorescent detection of flaws. 4,273,671, Cl. 252-301.190.

Allman, Richard D.: *See—*
Meyer, Paul M.; Beckwith, Robert H.; Allman, Richard D.; and Jefferis, Mark, 4,274,144, Cl. 364-551.000.

Allonsius, Georges. Indicia selector. 4,273,335, Cl. 273-144.00B.

Aloi, Michael J.; and Hancock, Kevin J., II. Built-in solar panel. 4,273,108, Cl. 126-450.000.

Alpha Solarco Inc.: *See—*
Uroshevich, Miroslav, 4,273,103, Cl. 126-438.000.
Uroshevich, Miroslav, 4,273,104, Cl. 126-439.000.
Uroshevich, Miroslav, 4,273,105, Cl. 126-443.000.

Alps Electric Co., Ltd.: *See—*
Sakamoto, Nozomu, 4,274,074, Cl. 338-160.000.
Yoshisato, Akiyuki; and Tobita, Katsumi, 4,274,066, Cl. 331-116.00R.

Alshin, Richard A.: *See—*
Wyman, Ransome J.; Alshin, Richard A.; and Gilbert, Charles H., 4,273,176, Cl. 152-327.000.

Altoz, Frank E.; and Winn, William H., to United States of America, Air Force. Mechanical heat transfer device. 4,273,183, Cl. 165-32.000.

Altuglu, Senol, to PPG Industries, Inc. Polyol (allyl carbonate) synthesis utilizing solid alkali metal hydroxide. 4,273,726, Cl. 260-463.000.

Aluminum Company of America: *See—*
Dawless, Robert K.; and Jacobs, Stanley C., 4,273,627, Cl. 204-67.000.

Alvarez, Francisco S., to Syntex (U.S.A.) Inc. 4-Halo steroids. 4,273,770, Cl. 424-241.000.

Amamoto, Kenneth I.: *See—*
Buck, Gordon H.; and Amamoto, Kenneth I., 4,273,332, Cl. 273-86.00R.

AMAX Inc.: *See—*
Laferty, John M.; Howe, Dennis L.; and Sebenik, Roger F., 4,273,745, Cl. 423-54.000.

Ambrosch, Friedrich; and Schwaebel, Rudolf, to Maschinenfabrik Augsburg-Nunberg Aktiengesellschaft. Method of and device for avoiding rotor instability to enhance dynamic power limit of turbines and compressors. 4,273,510, Cl. 415-119.000.

Amchem Products, Inc.: *See—*
Kelly, Timm L., 4,273,592, Cl. 148-6.270.

American Can Company: *See—*
Herdzina, Frank J.; and Vandlik, Robert P., 4,273,507, Cl. 414-750.000.

American Cyanamid Company: *See—*
Noland, James S.; and Hajek, Miroslav, 4,273,686, Cl. 260-9.000.
Shepherd, Robert G., 4,273,785, Cl. 424-316.000.
Zweig, Arnold; and Hoffmann, Arthur K., 4,273,764, Cl. 424-174.000.

American Gas Furnace Company: *See—*
Bayly, William I.; Rumbolo, Louis J.; Fazekas, Ernest E.; and Korzeb, Frank, 4,273,493, Cl. 414-221.000.

American Home Products Corporation: *See—*
Demerson, Christopher A.; Humber, Leslie G.; and Ferland, Jean-Marie, 4,273,773, Cl. 424-250.000.

American Hospital Supply Corporation: *See—*
Swartz, Dorian J., 4,273,638, Cl. 204-195.00P.

American Optical Corporation: *See—*
LaLiberte, Norman U.; and Rotenberg, Don H., 4,273,809, Cl. 427-155.000.

American Safety Equipment Corporaion: *See—*
Tanaka, Akira, 4,273,368, Cl. 292-53.000.

American Standard Inc.: *See—*
Morris, Robert B.; and Kyllonen, Allen W., 4,273,218, Cl. 188-18.00A.

Ameron, Inc.: *See*—
McLaughlin, Hugh T., 4,273,161, Cl. 138-149.000.

Ames, Thomas J.: *See*—
Piazza, Andre L.; Krenek, Michael J.; and Ames, Thomas J., 4,273,472, Cl. 405-211.000.

Amick, David R., to Rohm and Haas Company. Polyamine-crosslinked anion exchange resin. 4,273,878, Cl. 521-32.000.

AMP Incorporated: *See*—
Bendiksen, Leonard F.; and Schumacher, William L., 4,273,413, Cl. 350-96.200.
Hughes, Donald W. K., 4,273,402, Cl. 339-91.00R.
Myers, Ronald W.; and Nardone, Daniel V., 4,273,399, Cl. 339-17.00C.

Anagnostopoulos, Gerasimos D., to National Research Development Corporation. Spiral plating apparatus. 4,273,877, Cl. 435-293.000.

Anagnostopoulos, Stavros M., to Exxon Research & Engineering Co. Tape tensioning mechanism. 4,273,454, Cl. 400-234.000.

Anderson, Bazeel B. Safety dispensing spout. 4,273,265, Cl. 222-189.000.

Anderson, Bruce H., to ComCoach Corporation. Vehicle door. 4,272,923, Cl. 49-360.000.

Anderson, Dean B.: *See*—
Thompson, David E.; Yao, Shi-Kay; August, Rudolf R.; and Anderson, Dean B., 4,273,445, Cl. 356-350.000.

Anderson, Harold E., to Sea Terminals Limited. Oil storage vessel, mooring apparatus and oil delivery for the off-shore production of oil. 4,273,066, Cl. 114-256.000.

Anderson, James D.: *See*—
Wigby, Jon; Piatt, Ralph L.; and Anderson, James D., 4,272,879, Cl. 29-566.200.

Anderson, William B.: *See*—
Blanc, Max A., 4,273,272, Cl. 222-464.000.

Andert, Charles M.: *See*—
Corley, John E.; Mitchell, Joseph M.; and Andert, Charles M., 4,273,481, Cl. 408-14.000.

Ando, Haruhisa: *See*—
Ohba, Shinya; Tanaka, Shuhei; Kubo, Masaharu; Ando, Haruhisa; Yamashita, Yataro; Hanamura, Shoji; Aoki, Masakazu; and Nakai, Masaaki, 4,274,113, Cl. 358-212.000.

Andrews, Mena G., to Combustion Engineering, Inc. High burnup nuclear fuel rod. 4,273,616, Cl. 176-68.000.

Andros Incorporated: *See*—
Jassawalla, Jal S., 4,273,121, Cl. 128-214.00F.

Angel, Richard R., to Phillips Petroleum Company. Insulated flexible pipe coupling. 4,273,363, Cl. 285-47.000.

Angelo, James F., II. Apparatus for continuously carbonizing and activating carbonaceous materials. 4,273,619, Cl. 202-211.000.

Angle, Rodney L., to RCA Corporation. Method for making a closed gate MOS transistor with self-aligned contacts with dual passivation layer. 4,272,881, Cl. 29-571.000.

Anspach, Roy L.: *See*—
Campbell, James R.; and Anspach, Roy L., 4,273,836, Cl. 428-595.000.

Anthone, Leo E.; and Berglund, Sidney J., to Minnesota Mining and Manufacturing Company. Continuous film carrier wire connecting system. 4,272,883, Cl. 39-751.000.

Anthony, Myron L. Solar energy system. 4,273,102, Cl. 126-435.000.

Aoki, Hisashi: *See*—
Takamizawa, Minoru; Okada, Fumio; Hara, Yasuaki; and Aoki, Hisashi, 4,273,907, Cl. 528-29.000.

Aoki, Masakazu: *See*—
Ohba, Shinya; Tanaka, Shuhei; Kubo, Masaharu; Ando, Haruhisa; Yamashita, Yataro; Hanamura, Shoji; Aoki, Masakazu; and Nakai, Masaaki, 4,274,113, Cl. 358-212.000.

Arai, Atsuaki: *See*—
Shiba, Keisuke; Hirose, Takeshi; Hayashi, Jun; Arai, Atsuaki; Furutachi, Nobuo; and Katsuyama, Harumi, 4,273,861, Cl. 430-382.000.

Arai, Hisaharu, to Aisan Industry Co., Ltd. Filter for fluid passage. 4,273,656, Cl. 210-448.000.

Arai, Katsushi: *See*—
Okamoto, Joji; Azuma, Hitoshi; Arai, Katsushi; Naito, Takemi; Kawai, Seiji; and Goto, Minoru, 4,273,811, Cl. 427-232.000.

Arcair Company: *See*—
Stepath, Myron D., 4,273,982, Cl. 219-70.000.

Arco Industries Ltd.: *See*—
Tsui, Kwok W., 4,272,909, Cl. 46-39.000.

Arco, Manuel J., to Minnesota Mining and Manufacturing Company. One-part solvent-free thermosettable blocked prepolymer composition containing a diene, together with chain extender, chain terminator and a dienophile. 4,273,909, Cl. 528-45.000.

Arenhold, Knut. Mud flap. 4,273,349, Cl. 280-154.50R.

Arisaka, Kunio; and Namioka, Kenta, to Copal Company Limited. Electric shutter device provided with an electric self-timer. 4,273,429, Cl. 354-30.000.

Armstrong Cork Company: *See*—
Schluter, Wolfram, 4,272,928, Cl. 52-1.000.

Armstrong, Thomas R., to Paradyne Corporation. System for in-service quantitative performance analysis of data communications system. 4,273,955, Cl. 178-69.00G.

Arnold, Dan M.; and Pitts, Robert W., Jr., to Texaco Inc. Fluid flow meter for mixed liquid and gas. 4,272,982, Cl. 73-19.000.

ARP Instruments, Inc.: *See*—
Dodds, Philip V. W.; and Smith, Mark L., 4,273,017, Cl. 84-1.100.

Artin, Robert L.; and Eimerman, Allen C., to Sunbeam Corporation. Slicing machine. 4,273,013, Cl. 83-167.000.

Asada, Mamoru; Shiga, Akinobu; Matsuyama, Kiyoshi; and Kakugo, Masahiro, to Sumitomo Chemical Co., Ltd. Process for producing propylene polymer or copolymer. 4,273,905, Cl. 526-142.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Hayashi, Yoshio; Matsui, Takeki; Shiga, Tetsuo; Akashi, Kageyasu; Akiyama, Minoru; and Kimura, Takeo, 4,273,723, Cl. 260-414.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Tuda, Koji; Nagashima, Hironobu; and Marui, Masatoshi, 4,273,959, Cl. 179-1.0SC.

Asano, Tamoru, to Kai Cutlery Center Co., Ltd. Shaver unit. 4,272,886, Cl. 30-47.000.

Asberg, Sture L., to SKF Nova AB. Device for axial adjustment of a rotatable body. 4,273,391, Cl. 308-174.000.

Ashland Oil, Inc.: *See*—
Gardikes, John J., 4,273,179, Cl. 164-43.000.
Kim, Young D., 4,273,693, Cl. 260-29.20N.

Asmar, Romeal F.: *See*—
Lukes, Henry J.; Kamphorst, Walter; and Asmar, Romeal F., 4,274,056, Cl. 328-162.000.

Assard, Gerald L., to United States of America, Navy. Synthesized sinusoid generator. 4,274,055, Cl. 328-14.000.

Asztalos, Stefan: *See*—
Turnwald, Ernst; Asztalos, Stefan; and Rosenmeier, Rudolf, 4,273,028, Cl. 91-275.000.

Athanasiades, Neocles: *See*—
McLoughlin, John; Rotblum, Yehuda; and Athanasiades, Neocles, 4,273,360, Cl. 280-751.000.

Atlantic Richfield Company: *See*—
Vartuli, James C.; and Zehner, Lee R., 4,273,677, Cl. 252-435.000.

Atlas Powder Company: *See*—
Olney, Robert S., 4,273,147, Cl. 137-13.000.

Auburn Enterprises, Inc.: *See*—
Olsen, C. Eric, 4,273,131, Cl. 128-341.000.

Audeh, Costandi A.; Heilweil, Israel J.; White, James R.; and Yan, Tsoung Y., to Mobil Oil Corporation. Solvent extraction production of lube oil fractions. 4,273,645, Cl. 208-323.000.

August, Rudolf R.: *See*—
Thompson, David E.; Yao, Shi-Kay; August, Rudolf R.; and Anderson, Dean B., 4,273,445, Cl. 356-350.000.

Aumann, James T.; and White, Harold G., to Christensen, Inc. Pressure core barrel flushing system. 4,272,987, Cl. 73-153.000.

Auth, David C.; and Rushmer, Robert F., to Research Corporation. Method for cutting and coagulating tissue. 4,273,127, Cl. 128-303.100.

Autoflug GmbH: *See*—
Nitzbon, Karl-Heinz, 4,273,210, Cl. 180-268.000.

Automated Building Components, Inc.: *See*—
Seipos, Andrew G., 4,272,938, Cl. 52-509.000.

Automobiles M. Berliet: *See*—
Fadda, Jean; and Pernet, Jean P., 4,273,563, Cl. 55-189.000.

Automobiles Peugeot: *See*—
Duguet, Pierre; and Robert, Christian, 4,273,376, Cl. 296-65.00R.

Avtex Fibers Inc.: *See*—
Smith, Frederick R., 4,273,118, Cl. 128-156.000.

Azuma, Hitoshi: *See*—
Okamoto, Joji; Azuma, Hitoshi; Arai, Katsushi; Naito, Takemi; Kawai, Seiji; and Goto, Minoru, 4,273,811, Cl. 427-232.000.

B. F. Goodrich Company, The: *See*—
Bush, Charles N.; Daniels, Charles A.; and Koebel, Ralph F., 4,273,904, Cl. 526-91.000.

B & W Metals Company, Inc.: *See*—
Barnhill, Donald R., 4,273,991, Cl. 219-440.000.

Baatz, Henning; and Rittscher, Dieter, to GNS Gesellschaft fur Nuklear-Service mbH. Radiation-shielding transport and storage vessel. 4,274,007, Cl. 250-506.000.

Baba, Toshihiko: *See*—
Hara, Katsunori; Baba, Toshihiko; and Okuda, Takio, 4,273,984, Cl. 219-97.000.

Babcock & Wilcox Company, The: *See*—
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Babinsky, Andrew D.: *See*—
Kidon, William E.; Shuster, Nicholas; and Babinsky, Andrew D., 4,273,628, Cl. 204-87.000.

Bachman, Joseph L.: *See*—
Ginther, George E., Sr.; Johnson, A. David, Jr.; and Bachman, Joseph L., 4,273,322, Cl. 271-149.000.

Backhaus, Hans-Gerd: *See*—
Scholz, Hansjurgen; Backhaus, Hans-Gerd; and Brambilla, Luigi, 4,273,359, Cl. 280-740.000.

Baenen, Paul W., to J. I. Case Company. Cable saw for tree harvesting apparatus. 4,273,169, Cl. 144-34.00R.

Bailey, David C., to Harris Corporation. Apparatus for storing and randomly accessing planar film records. 4,273,427, Cl. 353-27.00A.

Baker, Alan C.: *See*—
Keran, Vitie P.; and Baker, Alan C., 4,273,314, Cl. 266-145.000.

Baker, Donald E.; and Bouette, David W., to E. T. Oakes Limited. Drive arrangement. 4,273,521, Cl. 418-48.000.

Baker, Eugene E.; Szarka, David D.; Davis, Odie R. S.; and Workman, Nolan M., to Halliburton Company. Method and apparatus for gravel packing multiple zones. 4,273,190, Cl. 166-278.000.

Balfour Beatty Limited: *See*—
Cyfka, Tadeusz R., 4,273,468, Cl. 405-132.000.

Bally Manufacturing Corporation: *See*—
Nicolaus, Frank G., 4,273,333, Cl. 273-143.00R.

Bankhead Enterprises, Inc.: *See*—
Blanar, Gregory G., 4,273,484, Cl. 410-12.000.

Barber, Everett M.; Muenger, James R.; and Alexander, David L., to Texaco Inc. Combination chemical plant and Brayton-cycle power plant. 4,273,743, Cl. 422-148.000.

Barkalow, Clare E.; and Elam, James O., to Michigan Instruments, Inc. Cardiopulmonary resuscitator, defibrillator and monitor. 4,273,114, Cl. 128-53.000.

Barnett, Allan E.; and Halluin, Albert P., to Exxon Research & Engineering Co. Process for hydrogenating organic compounds by use of non-ferrous group VIII aluminum coprecipitated catalysts. 4,273,939, Cl. 564-358.000.

Barnett, Allan E.: *See*—
Halluin, Albert P.; and Barnett, Allan E., 4,273,680, Cl. 252-466.00J.

Barnhill, Donald R., to B & W Metals Company, Inc. Pressure cooker. 4,272,991, Cl. 219-440.000.

Barre, Claude, to U.S. Philips Corporation. DC-DC Converter for charging a battery by means of a solar cell. 4,274,044, Cl. 320-21.000.

Bartholomew, Alan E.: *See*—
Smith, Lloyd T.; Bartholomew, Alan E.; Fee, Robert W.; Meister, Michael L.; Robbins, Richard J.; and Ten Eyck, Richard E., 4,273,173, Cl. 81-177.00M.

BASF Aktiengesellschaft: *See*—
Heilen, Gerd; Nissen, Axel; Koernig, Wolfgang; Horner, Michael; Fliege, Werner; and Boettger, Guenter, 4,273,945, Cl. 568-420.000.
Merger, Franz; and Foerster, Hans-Juergen, 4,273,934, Cl. 560-238.000.
Merger, Franz; Nestler, Gerhard; and Kempe, Uwe, 4,273,938, Cl. 564-124.000.

BASF Wyandotte Corporation: *See*—
Newkirk, David D.; and Login, Robert B., 4,273,946, Cl. 568-625.000.
Otten, Jay G., 4,273,881, Cl. 521-108.000.

Bassetti, Henry; and Spector, George. Electrified doll house fireplace. 4,272,908, Cl. 46-12.000.

Bastian, Jean-Michel: *See*—
Waldvogel, Erwin; Bastian, Jean-Michel; and Schwarb, Gustav, 4,273,780, Cl. 424-267.000.

Bates, Edson C.; and King, Jeanne A., to Owens-Illinois, Inc. Foam specimen apparatus and method. 4,273,012, Cl. 83-17.000.

Bator, Cathryn D.: *See*—
Porzel, Rita E.; and Bator, Cathryn D., 4,273,688, Cl. 260-17.40R.

Bauer, Egon: *See*—
Beeskow, Bruno; Bauer, Egon; and Pfundstein, Wolfgang, 4,273,030, Cl. 91-450.000.

Baugh, K. Boyd: *See*—
Nall, Clive; Long, Leo E.; Rigby, Sterling C.; and Baugh, K. Boyd, 4,273,327, Cl. 272-97.000.

Bayer Aktiengesellschaft: *See*—
Berg, Dieter; Frommer, Werner; Schmidt, Delf; Schmidt, Robert R.; and Schafer, Dietmar, 4,273,571, Cl. 71-79.000.
Brinkmann, Uwe; Telle, Helmut; Raue, Roderich; and Schellhammer, Carl-Wolfgang, 4,274,062, Cl. 331-94.50L.
Grohe, Klaus; and Lurssen, Klaus, 4,273,573, Cl. 71-90.000.
Harms, Wolfgang; Jager, Horst; von Oertzen, Klaus; and Wunderlich, Klaus, 4,273,553, Cl. 8-549.000.
Kotulla, Bernhard; Haas, Hans; Weiser, Martin; Forster, Rolf; Preis, Lothar; and Schmidt, Rudolf, 4,273,476, Cl. 405-258.000.
Kuhle, Engelbert; Hagemann, Hermann; Behrenz, Wolfgang; Hammann, Ingeborg; and Stendel, Wilhelm, 4,273,767, Cl. 424-211.000.
Pump, Wichard; Becker, Wolfgang; and Woldenberg, Edwin, 4,273,880, Cl. 521-93.000.

Bayly, William I.; Rumbolo, Louis J.; Fazekas, Ernest E.; and Korzeb, Frank, to American Gas Furnace Company. Rotary furnace volumetric feeder with sealed chute. 4,273,493, Cl. 414-221.000.

Bazilevich, Sergei V., deceased: *See*—
Boriskin, Ivan K.; Bragin, Jury S.; Bykov, Mikhail S.; Gubanov, Valentin I.; Ivanov, Vladlen M.; Tool, Eduard A.; Bazilevich, Sergei V., deceased; Bazilevich, Tatyana N., administrator; Sergeev, Vitaly A., deceased; Sergeeva, Valentina I., administrator; and Sergeeva, Elena V., administrator, 4,273,298, Cl. 241-189.00R.

Bazilevich, Tatyana N., administrator: *See*—
Boriskin, Ivan K.; Bragin, Jury S.; Bykov, Mikhail S.; Gubanov, Valentin I.; Ivanov, Vladlen M.; Tool, Eduard A.; Bazilevich, Sergei V., deceased; Bazilevich, Tatyana N., administrator; Sergeev, Vitaly A., deceased; Sergeeva, Valentina I., administrator; and Sergeeva, Elena V., administrator, 4,273,298, Cl. 241-189.00R.

BBC Brown, Boveri & Company, Limited: *See*—
Buxbaum, Charley, 4,274,029, Cl. 313-204.000.
Buxbaum, Charley, 4,274,030, Cl. 313-346.00R.
Thoma, Kurt; and Ulrich, Urban, 4,273,185, Cl. 165-80.00B.

Beaufort Air-Sea Equipment Ltd.: *See*—
Oldham, Walter, 4,272,857, Cl. 9-345.000.

Beck, Blaine E.; and Corris, Charles J. Vehicle safety illumination device. 4,274,127, Cl. 362-72.000.

Becker, Joseph J., to Firmenich, S.A. Tricyclic lactones. 4,273,714, Cl. 260-343.210.

Becker, Mitchell, to Halcon Research & Development Corp. Method of treating alpha-methylbenzylalcohol dehydration products. 4,273,622, Cl. 203-28.000.

Becker, Wolfgang: *See*—
Pump, Wichard; Becker, Wolfgang; and Woldenberg, Edwin, 4,273,880, Cl. 521-93.000.

Beckwith, Robert H.: *See*—
Meyer, Paul M.; Beckwith, Robert H.; Allman, Richard D.; and Jefferis, Mark, 4,274,144, Cl. 364-551.000.

Becton, Dickinson and Company: *See*—
Selleck, Robert W., 4,273,240, Cl. 198-835.000.

Beecham Group, Limited: *See*—
Hadley, Michael S.; and King, Francis D., 4,273,778, Cl. 424-265.000.

Beeskow, Bruno; Bauer, Egon; and Pfundstein, Wolfgang, to Daimler-Benz Aktiengesellschaft. Pressure relief valve for the working pressure of a servo-steering system. 4,273,030, Cl. 91-450.000.

Behnke, Edward R.; and Sanderson, Floyd W., to Columbus McKinnon Corporation. Claw hook assembly. 4,273,371, Cl. 294-78.00R.

Behrenz, Wolfgang: *See*—
Kuhle, Engelbert; Hagemann, Hermann; Behrenz, Wolfgang; Hammann, Ingeborg; and Stendel, Wilhelm, 4,273,767, Cl. 424-211.000.

Beirne, Patrick R.: *See*—
Cowpland, Michael C. J.; and Beirne, Patrick R., 4,273,965, Cl. 179-84.0VF.

Beitzel, Stuart W. Purification of water through the use of ozone and ultraviolet light. 4,273,660, Cl. 210-760.000.

Belebashev, Eduard K.: *See*—
Tertishnikov, Anatoly S.; Platunov, Boris P.; Novikov, Alexei V.; Gordeev, Nikolai A.; Belebashev, Eduard K.; Lovtsov, Dmitry P.; Korytov, Vladimir A.; and Ignatiev, Jury P., 4,273,180, Cl. 164-49.000.

Bell, David A., to Interprovincial Steel and Pipe Corporation, Ltd. Pipeline leak detection method and control device therefor. 4,272,984, Cl. 73-40.50R.

Bell & Howell Company: *See*—
Farnham, Stewart E., 4,274,120, Cl. 360-106.000.
Stocker, Lester H., 4,273,319, Cl. 270-21.100.

Bell, Malcolm R.; and Oesterlin, Rudolf, to Sterling Drug Inc. Phenyl and lower alkyl substituted pyrrole-3-acrylonitriles. 4,273,713, Cl. 260-326.620.

Bell, Richard S., to Mighty-Mac, Inc. Garment with shoulder attached supporting straps. 4,272,852, Cl. 2-94.000.

Bell, Robert E. Instrumental mute. 4,273,022, Cl. 84-400.000.

Bell Telephone Laboratories, Incorporated: *See*—
Alferness, Rodney C., 4,273,411, Cl. 350-96.140.
Briggs, Paul R., Jr.; and Scerbo, Louis J., 4,273,966, Cl. 179-98.000.
Clemons, Donald G.; and Huber, William R., III, 4,274,013, Cl. 307-530.000.
Condon, Joseph H., 4,274,051, Cl. 324-117.00R.
Favin, David L.; Lynn, Peter F.; and Snyder, Paul J., 4,273,970, Cl. 179-175.30R.
Gentry, James H., Jr.; and Stiles, Gilbert J., Sr., 4,274,052, Cl. 324-117.00R.
Hecken, Rudolf P., 4,274,047, Cl. 324-57.00R.
Heller, Adam; Leamy, Harry J.; Miller, Barry; Nelson, Ronald J.; and Parkinson, Bruce A., 4,273,594, Cl. 148-33.300.
Pfarre, Edgar L., 4,274,071, Cl. 336-12.000.
Seidel, Harold, 4,273,963, Cl. 179-16.00F.

Bellot, Ramon: *See*—
Hess, Anton; and Bellot, Ramon, 4,272,872, Cl. 29-113.00R.

Ben-Dor, Effraim; and Lemelson, Jerome H. Roller skate. 4,273,345, Cl. 280-11.200.

Benckendorff, Wolfgang; and Kubler, Hans, to Siemens Aktiengesellschaft. Security alarm system. 4,274,086, Cl. 340-506.000.

Bendiksen, Leonard F.; and Schumacher, William L., to AMP Incorporated. Photoelectric element/optical cable connector. 4,273,413, Cl. 350-96.200.

Bendix Corporation, The: *See*—
Vogel, Ronald F., 4,274,125, Cl. 361-283.000.

Bennett Engineering Inc.: *See*—
Bennett, Harold L., 4,273,643, Cl. 208-8.00R.

Bennett, George R.: *See*—
Hinchcliffe, Dennis; Bennett, George R.; and Heybourn, Frank, 4,273,233, Cl. 198-347.000.

Bennett, Harold L., to Bennett Engineering Inc. Process for production of synthetic crude oil, alcohols, and chars during low temperature carbonization of coals. 4,273,643, Cl. 208-8.00R.

Benson, Jack H.: *See*—
Gibbs, Dale S.; Benson, Jack H.; and Fernandez, Reet T., 4,273,901, Cl. 525-455.000.

Benson, Richard L.; Hill, Horace E.; and Soderberg, Mark S., to Boeing Company, The. Motor quick-change chuck system for tool having cylindrically shaped adapter portion. 4,273,344, Cl. 279-75.000.

Benson, Robert W. Bodyguide and holddown system usable with dump trucks and trailers. 4,273,382, Cl. 298-38.000.

Bentley, George W., to Brown & Williamson Tobacco Corporation. Firmness improvement in cigarette rod. 4,273,139, Cl. 131-280.000.

Bentzien, Len, to Universal Foods Corporation. Product reclamation in a fluid bed dryer. 4,272,895, Cl. 34-10.000.

Beraud, Claudius; and Jacquemart, Jean, to Institut Textile de France. Process and apparatus for the treatment of fibrous webs. 4,273,635, Cl. 204-165.000.

Berecz, Imre. Progressive stage forging machine. 4,272,978, Cl. 72-335.000.

Berg, Dieter; Frommer, Werner; Schmidt, Delf; Schmidt, Robert R.; and Schafer, Dietmar, to Bayer Aktiengesellschaft. Organic chemical compound, microbiological process for its preparation, and its use as a herbicide. 4,273,571, Cl. 71-79.000.

Bergles, Eduard, to Fichtel & Sachs AG. Bicycle chain-shifting device. 4,273,546, Cl. 474-82.000.

Berglund, Sidney J.: *See*—
Anthone, Leo E.; and Berglund, Sidney J., 4,272,883, Cl. 39-751.000.

Berko, Peter, to D. W. Zimmerman Mfg., Inc. Apparatus for manipulating signature bundles. 4,273,499, Cl. 414-626.000.

Berkowitz, Sidney, to FMC Corporation. Preparation of salts of dihalogenated isocyanurates by oxidative hydrolysis of amino substituted triazines. 4,273,928, Cl. 544-190.000.

Berndt, Klaus-Gunther; Kruger, Manfred; and Nawrot, Wolfgang, to Siemens Aktiengesellschaft. Low-voltage circuit breaker with means for limiting contact lifting. 4,273,979, Cl. 200-286.000.

Berne, Jean, to Societe Nouvelle des Ateliers et Chantiers du Havre. Ship stabilizer. 4,273,063, Cl. 114-126.000.

Berry, Kenneth L., to Du Pont de Nemours, E. I., and Company. Acicular α-iron particles and recording media employing same. 4,273,807, Cl. 427-132.000.

Bertram, James L.; and Sheih, Pong Su, to Dow Chemical Company, The. Water-soluble epoxy resins and process for their preparation. 4,273,921, Cl. 528-405.000.

Bessouat, Roger; and Marjollet, Jacques, to Stein Industrie. Vertical steam separator-superheater. 4,273,077, Cl. 122-483.000.

Bibeau, Jean-Marie; and Bibeau, Marcel. Dump body for mounting on the frame of a vehicle. 4,273,381, Cl. 298-1.00H.

Bibeau, Marcel: *See*—
Bibeau, Jean-Marie; and Bibeau, Marcel, 4,273,381, Cl. 298-1.00H.

Biemiller, Eric C., to Combustion Engineering, Inc. Weld metal resistant to neutron-bombardment embrittlement. 4,273,838, Cl. 428-683.000.

Bio-Melktechnik Swiss Hoefelmayr & Co.: *See*—
Hoefelmayr, Tilman, 4,273,070, Cl. 119-14.510.

Biochem International Inc.: *See*—
Ricciardelli, Robert H., 4,273,134, Cl. 128-635.000.

Bird Electronic Corporation: *See*—
Trefney, Ralph P., 4,274,156, Cl. 455-115.000.

Birkhofer, Herbert; Diekhoner, Gunther; and Hoffler, Hans-Otto, to Schaeffer-Homberg GmbH. Machine for the attachment of rivets, buttons or the like on clothing pieces. 4,273,280, Cl. 227-107.000.

Bisch, Jeffery R. Simulated monster toy and game. 4,272,913, Cl. 46-123.000.

Bisczat, John J.; Lisk, Robert R.; McCray, William R.; and Sizemore, James L., to International Business Machines Corporation. Paper insertion apparatus for a typewriter. 4,273,456, Cl. 400-550.000.

Bittner, Klaus-Jurgen: *See*—
Kostner, Armin; Lenhart, Richard; and Bittner, Klaus-Jurgen, 4,273,551, Cl. 493-243.000.

Bjorksten, Thorolf R.: *See*—
Brown, Vaikai K.; Bjorksten, Thorolf R.; and Walter, Llewellyn L., 4,273,224, Cl. 192-4.00A.

Black & Decker Inc.: *See*—
Sauerwein, William D., 4,272,996, Cl. 74-50.000.

Black, Paul W.: *See*—
Pringle, Ronald E.; and Black, Paul W., 4,273,194, Cl. 166-323.000.

Blackert, Hanno: *See*—
Hermanns, Winfried; Lueg, Heinz; Blackert, Hanno; and Wimmenauer, Dirk, 4,274,076, Cl. 340-38.00L.

Blacks Equipment Limited: *See*—
Edson, Donald; and Carter, Albert W., 4,273,986, Cl. 219-123.000.

Blanar, Gregory G., to Bankhead Enterprises, Inc. Quick release winch tie down and ramp assembly. 4,273,484, Cl. 410-12.000.

Blanc, Max A., to Anderson, William B.; and Blanc, Max Alain, part interest to each. Liquid dispenser. 4,273,272, Cl. 222-464.000.

Blanc, Max Alain: *See*—
Blanc, Max A., 4,273,272, Cl. 222-464.000.

Blanche, Stephen A.; and Portrais, Lee, to Victor Electric Wire & Cable. Connector having low profile contact element. 4,273,409, Cl. 339-206.00P.

Blank, Hans G.; and Resnick, Martin L., to GTE Laboratories Incorporated. Apparatus for communicating with processing apparatus over a telephone network. 4,273,961, Cl. 179-5.00R.

Blanz, John H. Torquer/thruster. 4,273,199, Cl. 173-149.000.

Blasio, Pietro; and Talini, Maurizio, to Le Metalli Industrialle S.p.A. Method for treating a spent emulsion of oil in water used in an industrial process, and the apparatus for carrying out the method. 4,273,611, Cl. 159-47.0WL.

Blattermann, Karl-Gunther; Neuhaus, Gunter; and Nolte, Gunther, to Conrad Scholtz AG. Cover belt conveyor with closure strips. 4,273,238, Cl. 198-605.000.

Blawert, Dieter; Rademacher, Karl-Heinz; and Sodler, Walter, to Sartorius GmbH. Apparatus for overload protection of precision scales. 4,273,203, Cl. 177-187.000.

Blee, Leonard J. Servo controlled vehicle suspension. 4,273,317, Cl. 267-64.00A.

Bletzinger, Peter: *See*—
Garscadden, Alan; Bletzinger, Peter; Hasinger, Siegfried H.; Olson, Robert A.; and Sarka, Benjamin, 4,274,065, Cl. 331-94.50G.

Blomsma, Everhard C.; and Holtslag, Paulus T. M., to Shell Oil Company. Offshore production riser with flexible connector. 4,273,470, Cl. 405-202.000.

Blount, David H. Process for the production of poly (polyisocyanate-polyol-alkali metal silicate solid. 4,273,908, Cl. 528-44.000.

Blum, Alvin S. Indicating test tube rack. 4,273,416, Cl. 350-239.000.

Board of Regents, State of Florida, for the use and benefit of the University of Florida: *See*—
Laitinen, Herbert A.; and Thornton, Donald C., 4,273,624, Cl. 204-23.000.

Bode, Rudolf: *See*—
Nauroth, Peter; Esch, Heinz; Kuhlmann, Robert; Bode, Rudolf; Reisert, Arthur; Buhler, Harald; and Turk, Gunter, 4,273,589, Cl. 106-308.00Q.

Bodenseewerk Perkin-Elmer: *See*—
Huber, Bernhard; and Gonner, Winfried, 4,273,742, Cl. 422-80.000.

Boebel, Manfred, to Richard Wolf GmbH. Forceps for applying clips to fallopian tubes. 4,273,129, Cl. 128-326.000.

Boehringer Mannheim GmbH: *See*—
Lauer, Karl; and Kiegel, Einhart, 4,273,711, Cl. 260-315.000.
Mollering, Hans; and Looser, Siegfried, 4,273,870, Cl. 435-26.000.

Boeing Company, The: *See*—
Benson, Richard L.; Hill, Horace E.; and Soderberg, Mark S., 4,273,344, Cl. 279-75.000.
Davert, Edward J., 4,272,890, Cl. 33-174.00G.
Somm, Paul T., 4,273,303, Cl. 244-104.0FP.

Boettger, Guenter: *See*—
Heilen, Gerd; Nissen, Axel; Koernig, Wolfgang; Horner, Michael; Fliege, Werner; and Boettger, Guenter, 4,273,945, Cl. 568-420.000.

Bokros, Jack C., to Carbomedics, Inc. Bi-leaflet heart valve. 4,272,854, Cl. 3-1.500.

Bolcavage, Richard D.; Ferraro, Armand J.; and Fleek, Arthur E., to International Business Machines Corporation. Belt printer control architecture. 4,273,041, Cl. 101-93.140.

Bolen, Charles E.: *See*—
Marzocchi, Alfred; Roberts, Michael G.; and Bolen, Charles E., 4,273,588, Cl. 106-273.00N.
Marzocchi, Alfred; Roberts, Michael G.; Bolen, Charles E.; and Harrington, Edward R., Jr., 4,273,685, Cl. 260-28.50R.

Boling, Norman L.: *See*—
McCollister, Howard L.; and Boling, Norman L., 4,273,826, Cl. 428-304.000.

Boller, Arthur; Schadt, Martin; and Villiger, Alois, to Hoffmann-La Roche Inc. Heterocyclic compounds. 4,273,929, Cl. 544-242.000.

Bollinger, Pietro, to Sandoz Ltd. Organic compounds. 4,273,784, Cl. 424-305.000.

Bolton, Jimmie B.; and Crews, Sam T., to Smith International, Inc. Earth boring apparatus with multiple welds. 4,273,159, Cl. 138-109.000.

Bompard, Bruno, to Commissariat a l'Energie Atomique. Filiform textile material. 4,272,950, Cl. 57-232.000.

Bonaguidi, Orland H. Inverted roof system. 4,272,936, Cl. 52-309.120.

Bone, David P.; and Robleski, Lynda, to Quaker Oats Company, The. Bulk packaged mixture of hard and soft pet foods. 4,273,788, Cl. 426-104.000.

Boonzajer Flaes, Ewoud A.: *See*—
Van de Leest, Renaat E.; Krijl, Gerrit; and Boonzajer Flaes, Ewoud A., 4,273,625, Cl. 204-56.00R.

Borg-Warner Corporation: *See*—
Krueger, Robert H., 4,273,744, Cl. 422-265.000.

Borgeaud, Gaston; and Pfister, Johann K., to Schweizerische Lokomotiv-und Maschinenfabrik. Railway vehicle traction and braking force transmitting system. 4,273,055, Cl. 105-199.00F.

Borichevsky, Donald J., to Telescope Folding Furniture Co., Inc., The. Collapsible chair. 4,273,379, Cl. 297-56.000.

Boriskin, Ivan K.; Bragin, Jury S.; Bykov, Mikhail S.; Gubanov, Valentin I.; Ivanov, Vladlen M.; Tool, Eduard A.; Bazilevich, Sergei V., deceased; by Bazilevich, Tatyana N., administrator; Sergeev, Vitaly A., deceased; by Sergeeva, Valentina I., administrator; and by Sergeeva, Elena V., administrator. Apparatus for crushing agglomerated mass. 4,273,298, Cl. 241-189.00R.

Borisof, Bernard. Self-adhering educational devices for constructing letters, figures, designs and the like. 4,273,537, Cl. 434-83.000.

Born, Gerhard: *See*—
Wahl, Alois; Elsner, Paul; and Born, Gerhard, 4,273,236, Cl. 198-432.000.

Born, Gunthard: *See*—
Sepp, Gunther; Born, Gunthard; and Malburg, Werner, 4,274,064, Cl. 331-94.50G.

Borodin, Alexandr A. Shutoff device. 4,273,156, Cl. 137-601.000.

Borowski, Kurt; Wagensonner, Eduard; and Cocron, Istvan, to AGFA Gevaert, A.G. Digital exposure-duration control circuit with upper limit on exposure duration. 4,273,428, Cl. 354-23.00D.

Bosco, Peter M.; and Sledzieski, William L., to Standard Brands Incorporated. Low-fat liquid spread and process. 4,273,790, Cl. 426-335.000.

Bosco, Peter M.; and Sledzieski, William L., to Standard Brands Incorporated. Low-fat spread and process. 4,273,795, Cl. 426-602.000.

Bosse, Frank, to Windmoller & Holscher. Braking apparatus for tape rollers of weaving shuttles. 4,273,162, Cl. 139-13.00A.

Bottazzi, Andrea: *See*—
Garzia, Aldo; Vittadini, Giorgio; Bottazzi, Andrea; Pelagalli, Domenico; and Coccoli, Costantino, 4,273,931, Cl. 546-344.000.

Bouette, David W.: *See*—
Baker, Donald E.; and Bouette, David W., 4,273,521, Cl. 418-48.000.

Bourgeois, Ronald D. Conveyor storage system. 4,273,234, Cl. 198-347.000.

Bowditch, Malcolm R., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State in Her Britannic Majesty's Government of the. Methods of making adhesive bonds. 4,273,598, Cl. 156-94.000.

Bowen, James A.: *See*—
Aley, Michael H.; Bowen, James A.; and Glass, Cecil A., 4,273,048, Cl. 102-363.000.

Bowthorpe-Hellermann Limited: *See*—
McCormick, Mathew, 4,272,870, Cl. 24-16.0PB.

Bradley, Alan V. Combination funnel and siphon. 4,273,166, Cl. 141-95.000.

Bragin, Jury S.: *See*—
Boriskin, Ivan K.; Bragin, Jury S.; Bykov, Mikhail S.; Gubanov, Valentin I.; Ivanov, Vladlen M.; Tool, Eduard A.; Bazilevich, Sergei V., deceased; Bazilevich, Tatyana N., administrator; Sergeev, Vitaly A., deceased; Sergeeva, Valentina I., administrator; and Sergeeva, Elena V., administrator, 4,273,298, Cl. 241-189.00R.

Braid, Milton; Horodysky, Andrew G.; and Kaminski, Joan M., to Mobil Oil Corporation. Friction reducing additives and compositions thereof. 4,273,665, Cl. 252-49.600.

Brambilla, Luigi: *See*—
Scholz, Hansjurgen; Backhaus, Hans-Gerd; and Brambilla, Luigi, 4,273,359, Cl. 280-740.000.

Brandolese, Ernesto, to Snamprogetti S.p.A. Rust-preventing agent for aqueous systems and rust-inhibiting lubricating compositions. 4,273,664, Cl. 252-49.500.

Brasa, Umberto. Serigraphic printing machine printing a number of objects in several colors. 4,273,044, Cl. 101-193.000.

Bremer, Clemens; and Post, Lothar, to Rheinmetall GmbH. Belt-advance mechanism for an automatic gas-loading belt-feed weapon, especially a machine gun. 4,273,025, Cl. 89-33.0CA.

Briggs, Paul R., Jr.; and Scerbo, Louis J., to Bell Telephone Laboratories, Incorporated. Terminal apparatus for telecommunications lines. 4,273,966, Cl. 179-98.000.

Briggs, Richard: *See*—
Gundal, Peter H.; and Briggs, Richard, 4,273,230, Cl. 192-150.000.

Brinkmann, Uwe; Telle, Helmut; Raue, Roderich; and Schellhammer, Carl-Wolfgang, to Bayer Aktiengesellschaft. Dyestuff laser. 4,274,062, Cl. 331-94.50L.

Bristol-Myers Company: *See*—
Nersesian, Ara, 4,273,721, Cl. 260-404.000.

British Steel Corporation: *See*—
Savidge, David H.; and Wadsworth, Eric, 4,274,054, Cl. 324-225.000.

Britt, Lilla V.: *See*—
Martinez, John; and Britt, Lilla V., 4,273,395, Cl. 312-205.000.

Brockway Glass Company, Inc.: *See*—
Hogan, Patrick M., 4,273,832, Cl. 428-410.000.

Brodie, Benjamin T.; and Koeman, Henriecus, to John Fluke Mfg. Co., Inc. Recirculating RMS AC conversion method and apparatus. 4,274,143, Cl. 364-483.000.

Bron Elektronik AG: *See*—
Haberthur-Heilig, Walter, 4,274,126, Cl. 361-334.000.

Brooks, Jeffrey S. Footwear. 4,272,899, Cl. 36-129.000.

Broussard, Garfford J. Orthodontic appliance and clasp therefor. 4,273,530, Cl. 433-6.000.

Brown, Boveri & Cie Aktiengesellschaft: *See*—
Dotsch, Erwin; Potschke, Jurgen; and Knacke, Ottmar, 4,273,810, Cl. 427-156.000.

Brown, Claude H., to Jet Research Center, Inc. Placement method for Q.D. charges using minimum diving time. 4,273,050, Cl. 102-321.000.

Brown, F. Barton: *See*—
Erickson, John W.; Brown, F. Barton; and White, Thomas A., Jr., 4,273,509, Cl. 415-111.000.

Brown, J. James, to Girard Equipment, Inc. Vibration resistant pressure actuated vacuum breaker. 4,273,153, Cl. 137-454.500.

Brown & Root, Inc.: *See*—
Weidler, Jay B., 4,273,474, Cl. 405-225.000.

Brown, Vaikai K.; Bjorksten, Thorolf R.; and Walter, Llewellyn L., to Towmotor Corporation. Vehicle control system with conditional transmission-brake interlock. 4,273,224, Cl. 192-4.00A.

Brown, William J.: *See*—
Fischer, Wolfgang; and Brown, William J., 4,273,485, Cl. 410-34.000.

Brown & Williamson Tobacco Corporation: *See*—
Bentley, George W., 4,273,139, Cl. 131-280.000.
Luke, John A., 4,273,600, Cl. 156-180.000.

Brugman, Johannes Antonius H., to Hunter Douglas International N.V. Panel construction. 4,272,937, Cl. 52-483.000.

Bruins, Roger C.; and Hart, Earl D. Automatic electric downrigger shut-off switch. 4,273,973, Cl. 200-47.000.

Brunken, Gerd, to Sachs-Systemtechnik GmbH. Magnetic security system. 4,274,080, Cl. 340-149.00R.

Bryant, Charles P.: *See*—
Pindar, John F.; Cohen, Jerome M.; and Bryant, Charles P., 4,273,891, Cl. 525-145.000.

Bube, Kenneth R., to RCA Corporation. Glazing paste for bonding a metal layer to a ceramic substrate. 4,273,822, Cl. 428-216.000.

Bucher-Guyer AG: *See*—
Schmid, Alfred, 4,273,000, Cl. 74-206.000.

Buchs, Wolfgang, to Messerschmitt-Bolkow-Blohm GmbH. Force infeed element for laminar panel assembly. 4,273,818, Cl. 428-116.000.

Buck, Gordon H.; and Amamoto, Kenneth I., to Mattel, Inc. Toy racing apparatus. 4,273,332, Cl. 273-86.00R.

Buckler, Robert T.; and Burd, John F., to Miles Laboratories, Inc. N-(hydroxyalkyl)-7-hydroxycoumarin-3-carboxamides. 4,273,715, Cl. 260-343.450.

Budd Company, The: *See*—
Dickhart, William W., III; and Marvin, Richard H., 4,273,498, Cl. 414-556.000.
Hulse, David O., 4,273,347, Cl. 280-80.00B.

Buddenhagen, Uwe, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Air-compressing direct injection internal combustion engine. 4,273,079, Cl. 123-276.000.

Buhler, Harald: *See*—
Nauroth, Peter; Esch, Heinz; Kuhlmann, Robert; Bode, Rudolf; Reisert, Arthur; Buhler, Harald; and Turk, Gunter, 4,273,589, Cl. 106-308.00Q.

Buhler, William J. Baseball player's chest protector. 4,272,847, Cl. 2-2.000.

Bulk Unit Load Systems Limited: *See*—
Snape, George W., 4,273,266, Cl. 222-199.000.

Bumgardner, Donald L.; and Schreiber, James N., to Burroughs Corporation. Automatic passbook reader/writer apparatus. 4,273,997, Cl. 235-449.000.

Bundy, Gordon L., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-11a-homo-TXA$_2$ compounds. 4,273,716, Cl. 260-345.90P.

Buneta, Paul. Bowler's finger support. 4,273,330, Cl. 273-54.00B.

Bunn, Christopher B.: *See*—
Bunn, Norman W.; and Bunn, Christopher B., 4,273,522, Cl. 425-113.000.

Bunn, Norman W.; and Bunn, Christopher B., to Dyform Engineering Limited. Reinforcing member support in concrete extruders. 4,273,522, Cl. 425-113.000.

Burd, John F.: *See*—
Buckler, Robert T.; and Burd, John F., 4,273,715, Cl. 260-343.450.

Burke, Ben G., to Chevron Research Company. Marine-drilling subbase assembly for a soft-bottom foundation. 4,273,471, Cl. 405-203.000.

Burnham, Paul W.: *See*—
Huggins, Raymond W.; Burnham, Paul W.; and Torrey, Arthur L., 4,273,069, Cl. 118-658.000.

Burris Industries, Inc.: *See*—
Grachten, Erich, 4,273,737, Cl. 264-46.500.

Burroughs Corporation: *See*—
Bumgardner, Donald L.; and Schreiber, James N., 4,273,997, Cl. 235-449.000.
Todd, Robert; and Haas, Frank J., 4,274,079, Cl. 340-146.3FT.

Bush, Charles N.; Daniels, Charles A.; and Koebel, Ralph F., to B. F. Goodrich Company, The. Process for producing homopolymers or copolymers of vinyl or vinylidene monomers by emulsion polymerization. 4,273,904, Cl. 526-91.000.

Bush, George E. Dispensing of fluent materials. 4,273,260, Cl. 222-135.000.

Butler Greenwich Inc.: *See*—
Crowley, Bucky, 4,273,045, Cl. 101-211.000.

Butt, Frederick A., to Owens-Corning Fiberglas Corporation. Process for reinforcing polyvinyl chloride pipe by wrapping with glass fibers coated with a polyester resin composition. 4,273,599, Cl. 156-172.000.

Butterworth, Edmund M., to Eaton Corporation. Joystick control electric switch. 4,273,972, Cl. 200-6.00A.

Buxbaum, Charley, to BBC Brown, Boveri & Company, Limited. Gas discharge device with metal oxide carrier in discharge path. 4,274,029, Cl. 313-204.000.

Buxbaum, Charley, to BBC Brown, Boveri & Company, Limited. Thermionic cathode. 4,274,030, Cl. 313-346.00R.

B.V. Arenco P.M.B.: *See*—
Eijsermans, Petrus A. H., 4,273,140, Cl. 131-328.000.

Byk-Mallinckrodt Chemische Produkte GmbH: *See*—
von Stetten, Otto; and Schmidt, Helmut, 4,273,865, Cl. 435-7.000.

Bykov, Mikhail S.: *See*—
Boriskin, Ivan K.; Bragin, Jury S.; Bykov, Mikhail S.; Gubanov, Valentin I.; Ivanov, Vladlen M.; Tool, Eduard A.; Bazilevich, Sergei V., deceased; Bazilevich, Tatyana N., administrator; Sergeev, Vitaly A., deceased; Sergeeva, Valentina I., administrator; and Sergeeva, Elena V., administrator, 4,273,298, Cl. 241-189.00R.

Byrnes, Thomas J., Jr., to ACF Industries, Incorporated. Tamper resistant idle adjustment screw. 4,273,730, Cl. 261-41.00D.

Bytzek, Klaus K., to Drive Manufacturing Inc. Method of pulley manufacture and product. 4,273,547, Cl. 474-170.000.

C&D Enterprises: *See*—
Conklin, Charles W., 4,274,034, Cl. 315-240.000.

Cabot Corporation: *See*—
Schwarz, Brian L., 4,273,566, Cl. 62-27.000.

Caine, Richard D. Universal X-ray film marker. 4,274,006, Cl. 250-476.000.

Cairns, Thomas M., to Ford Motor Company. Locking structure for electrical connectors. 4,273,403, Cl. 339-91.00R.

Calgon Corporation: *See*—
Sinha, Rabindra K.; Polinsky, Charles K.; Cifrulak, Stephen D., Sr.; and Wagner, Norman J., 4,273,751, Cl. 423-244.000.

California Institute of Technology: *See*—
Cuk, Slobodan M.; and Middlebrook, Robert D., 4,274,133, Cl. 363-39.000.

Calor Group Limited, The: *See*—
Kent, Peter J. C.; and Page, John K. R., 4,273,667, Cl. 252-70.000.

Camco, Incorporated: *See*—
Pringle, Ronald E.; and Black, Paul W., 4,273,194, Cl. 166-323.000.

Campbell, James R.; and Anspach, Roy L., to Mahoney, Thomas P. Core strip blank, core strip and method of making same. 4,273,836, Cl. 428-595.000.

Canon Kabushiki Kaisha: *See*—
Iwama, Hideto; Toyama, Masamichi; Shimazaki, Mamoru; and Ichiyanagi, Toshikazu, 4,273,426, Cl. 352-169.000.
Kobayashi, Hajime; Yano, Yasuhiro; and Endo, Ichiro, 4,273,844, Cl. 430-48.000.

Kobayashi, Hajime; Yano, Yasuhiro; and Endo, Ichiro, 4,273,845, Cl. 430-48.000.
Matsuda, Mutsuhide; Tamamura, Hideo; Taguchi, Tetsuya; Okino, Tadashi; and Yazaki, Mutsunobu, 4,273,432, Cl. 354-145.000.
Noda, Atsushi, 4,273,457, Cl. 400-705.100.

Canzek, Ludvik, to Kern & Co. A.G. High speed catadioptric objective lens system. 4,273,425, Cl. 350-444.000.

Capuano, Terry D., to Lamson & Sessions Co., The. Thread convolution. 4,273,175, Cl. 411-168.000.

Carbomedics, Inc.: *See*—
Bokros, Jack C., 4,272,854, Cl. 3-1.500.

Carder, Charles H.; and Koleske, Joseph V., to Union Carbide Corporation. Radiation curable dispersions containing high molecular weight essentially nonpolymerizable vinyl resins. 4,273,633, Cl. 204-159.170.

Carefree Bicycle Tire Company: *See*—
Wyman, Ransome J.; Alshin, Richard A.; and Gilbert, Charles H., 4,273,176, Cl. 152-327.000.

Carl Freudenberg, Firma: *See*—
Freudenberg, Bertram; Schuhmacher, Gunter; and Muhlfeld, Horst, 4,273,911, Cl. 528-49.000.

Carlo Erba Strumentazione S.p.A.: *See*—
Sisti, Giorgio; Riva, Ermete; and Italiano, Pietro, 4,272,983, Cl. 73-38.000.

Carlson, Eric J., to General Electric Company. Ternary electrolyte for secondary electrochemical cells. 4,273,841, Cl. 429-199.000.

Carnahan, James C., to General Electric Company. Monocapped bisphenol salts and method of making. 4,273,717, Cl. 260-345.90R.

Carpenter, Leon G.: *See*—
Carrier, Lee A.; and Carpenter, Leon G., 4,273,362, Cl. 283-6.000.

Carpenter, Neil L. Method and apparatus for recovering natural gas from geopressured salt water. 4,273,189, Cl. 166-266.000.

Carr, Peter; and Laethem, Alfred F., to Energy Development Associates, Inc. Activating carbonaceous electrodes. 4,273,839, Cl. 429-51.000.

Carrera, June F.: *See*—
Carrera, Michael A.; Carrera, June F.; Littner, Melvyn S.; and Littner, Lorna C., 4,273,337, Cl. 273-243.000.

Carrera, Michael A.; Carrera, June F.; Littner, Melvyn S.; and Littner, Lorna C. Family sex education board game. 4,273,337, Cl. 273-243.000.

Carrier, Lee A.; and Carpenter, Leon G., to Ludlow Corporation. Information-bearing article for conveying information which cannot be surreptitiously detected. 4,273,362, Cl. 283-6.000.

Carrieri, Louis F., to Gulf & Western Manufacturing Company. Load equalizer for press tooling. 4,272,980, Cl. 72-404.000.

Carter, Albert W.: *See*—
Edson, Donald; and Carter, Albert W., 4,273,986, Cl. 219-123.000.

Carter, Eric L.; and Nosowicz, Eugene J., to International Business Machines Corporation. Cascode polarity hold latch having integrated set/reset capability. 4,274,017, Cl. 307-289.000.

Carter, George W.: *See*—
Haviv, Fortuna; and Carter, George W., 4,273,940, Cl. 564-372.000.

Casimir Kast GmbH & Co. K.G.: *See*—
Nopper, Herbert, 4,273,981, Cl. 219-10.49R.

Casio Computer Co., Ltd.: *See*—
Yanagawa, Mikio, 4,274,146, Cl. 364-705.000.

Cassella Aktiengesellschaft: *See*—
Piesch, Steffen; Dorries, Peter; Schmidt, Ewald; and Hensel, Richard, 4,273,669, Cl. 252-182.000.

Cassimally, K. A. I.; and Frommelt, Horace, to Cassimally, K. A. I. Combined portable case and luggage trolley. 4,273,222, Cl. 190-18.00A.

Caterpillar Tractor Co.: *See*—
Cleveland, Gary L.; and Taylor, Clyde O., 4,273,081, Cl. 123-41.080.
Goloff, Alexander, 4,273,087, Cl. 123-299.000.
Goloff, Alexander, 4,273,178, Cl. 164-4.000.

Cave, David L.; and Davies, Robert B., to Motorola, Inc. Saturation limited bias circuit for complementary transistors. 4,274,018, Cl. 307-300.000.

Cavitron Corporation: *See*—
Enderby, Charles E., 4,273,109, Cl. 128-6.000.

Cedergren, Stig. Locking security container. 4,273,478, Cl. 406-189.000.

Central Pre-Mix Concrete Co.: *See*—
Hodneland, Jan, 4,273,231, Cl. 193-10.000.

Centrilift, Inc.: *See*—
Guzy, Raymond L., 4,273,953, Cl. 174-84.00R.

Centro Sperimentale Metallurgico S.p.A.: *See*—
Masucci, Pasquale; and Sommovigo, Paolo, 4,273,948, Cl. 13-9.0ES.

Chafetz, Harry: *See*—
Hammond, Kenneth G.; and Chafetz, Harry, 4,273,663, Cl. 252-34.000.

Chairez, Ruben: *See*—
Ling, Chung-Mei; Decker, Richard H.; and Chairez, Ruben, 4,273,756, Cl. 424-1.000.

Champion International Corporation: *See*—
Vassiliades, Anthony E., 4,273,672, Cl. 252-316.000.

Champlain Cable Corporation: *See*—
Perreault, Aime J., 4,273,829, Cl. 428-383.000.

Chandler, Earl E. Apparatus for supportingly organizing and displaying miscellaneous articles. 4,273,394, Cl. 312-184.000.

Chanel: *See*—
Lehmann, Myrtil B., 4,273,248, Cl. 215-331.000.

Chang, Clarence D., to Mobil Oil Corporation. De-aluminization of aluminosilicates. 4,273,753, Cl. 423-328.000.

Chang, Pek S. Adjustable-height support apparatus. 4,273,306, Cl. 248-421.000.

Chapman, Derek D.; and Wu, E-ming, to Eastman Kodak Company. Nondiffusible heterocyclylazonaphthol dye-releasing compounds. 4,273,706, Cl. 260-156.000.

Charland, Raymond J., to Litton Industrial Products, Inc. Stem seal for a fire safe ball valve. 4,273,148, Cl. 137-72.000.

Chartered Industries of Singapore Private Limited: *See*—
Waters, Frank E., 4,272,902, Cl. 42-25.000.

Chemische Werke Huls Aktiengesellschaft: *See*—
Feldmann, Rainer; Muller, Karl-Adolf; and Hornung, Karl-Heinz, 4,273,919, Cl. 528-313.000.

Cheng, Peter J.; Dockendorff, Jay D.; and Wright, Ernest L., to HPD Incorporated. Apparatus for and method of removing radioactive bottoms from an evaporator. 4,273,670, Cl. 252-301.10W.

Chester, John, to Ferodo Limited. Friction materials. 4,273,699, Cl. 260-38.000.

Chevron Research Company: *See*—
Burke, Ben G., 4,273,471, Cl. 405-203.000.
Singer, Malcolm S., 4,273,572, Cl. 71-86.000.

Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt.: *See*—
Ghyczy, Jeno; Szoke, Sandor; and Csermely, Gyorgy, 4,273,679, Cl. 252-466.00J.

Chiquet, Claude. Device for external fixation of bone fragments. 4,273,116, Cl. 128-92.00A.

Chitre, Sanjiv R., to Photowatt International, Inc. Solar cell and fabrication thereof using microwaves. 4,273,950, Cl. 136-255.000.

Choisel, Daniel P. L. Prefabricated wall structure for forming an enclosure such as a horse-box. 4,273,072, Cl. 119-27.000.

Christensen, Burton G.; Ratcliffe, Ronald W.; and Salzmann, Thomas N., to Merck & Co., Inc. Process for the preparation of thienamycin and intermediates. 4,273,709, Cl. 260-239.00A.

Christensen, Inc.: *See*—
Aumann, James T.; and White, Harold G., 4,272,987, Cl. 73-153.000.

Chun, Hugh, to Greer Hydraulics, Incorporated. Pressure pulse dampening device. 4,273,158, Cl. 138-30.000.

Ciba-Geigy Corporation: *See*—
Abel, Heinz, 4,273,554, Cl. 8-557.000.
Finch, Neville, 4,273,779, Cl. 424-266.000.
Stanek, Jaroslav, 4,273,766, Cl. 424-180.000.

Cifrulak, Stephen D., Sr.: *See*—
Sinha, Rabindra K.; Polinsky, Charles K.; Cifrulak, Stephen D., Sr.; and Wagner, Norman J., 4,273,751, Cl. 423-244.000.

Citizen Watch Company Limited: *See*—
Kume, Kazunari; Watanabe, Minoru; Ohno, Hideshi; and Tamaru, Munetaka, 4,274,153, Cl. 368-80.000.

Clark, Colin R.; Shore, Arthur R.; and Corbett, Robert A., to Sun Valley Poultry Limited. Containers for transporting poultry. 4,273,071, Cl. 119-17.000.

Clark, Keith H.; and Johnston, James D., to United States of America, National Aeronautics and Space Administration. Pneumatic inflatable end effector. 4,273,505, Cl. 414-735.000.

Claudius Peters AG: *See*—
Krauss, Werner, 4,273,451, Cl. 366-101.000.

Clear Corporation, The: *See*—
Cowden, Ernest A.; and Lauber, Leo E., 4,272,934, Cl. 52-202.000.

Clemons, Donald G.; and Huber, William R., III, to Bell Telephone Laboratories, Incorporated. Sense amplifier. 4,274,013, Cl. 307-530.000.

Cleveland, Gary L.; and Taylor, Clyde O., to Caterpillar Tractor Co. Vent valve for engine cooling systems. 4,273,081, Cl. 123-41.080.

CMI Corporation: *See*—
Rosenbaum, Glen F., 4,273,369, Cl. 293-1.000.

Coachmen Industries, Inc.: *See*—
Krein, Reuben J., 4,272,874, Cl. 29-235.000.

Coca-Cola Company, The: *See*—
Harvill, William A., 4,272,968, Cl. 62-394.000.

Coccoli, Costantino: *See*—
Garzia, Aldo; Vittadini, Giorgio; Bottazzi, Andrea; Pelagalli, Domenico; and Coccoli, Costantino, 4,273,931, Cl. 546-344.000.

Cocron, Istvan: *See*—
Borowski, Kurt; Wagensonner, Eduard; and Cocron, Istvan, 4,273,428, Cl. 354-23.00D.

Cogliano, Joseph A., to W. R. Grace & Co. Passive solar heating and cooling panels. 4,273,100, Cl. 126-433.000.

Cohen, Jerome M.: *See*—
Pindar, John F.; Cohen, Jerome M.; and Bryant, Charles P., 4,273,891, Cl. 525-145.000.

Colgate-Palmolive Company: *See*—
Gaffar, Abdul; and Gaffar, Maria C., 4,273,759, Cl. 424-54.000.
Grey, Seymour, 4,273,661, Cl. 252-8.800.

Coll-Palagos, Miguel, to Stauffer Chemical Company. Plated metal article. 4,273,837, Cl. 428-647.000.

Collum, Paulette: *See*—
Martin, Jerry R.; Tadanier, John S.; and Collum, Paulette, 4,273,924, Cl. 536-17.00R.

Columbus McKinnon Corporation: *See*—
Behnke, Edward R.; and Sanderson, Floyd W., 4,273,371, Cl. 294-78.00R.

Combustion Engineering, Inc.: *See*—
Andrews, Mena G., 4,273,616, Cl. 176 38.000.
Biemiller, Eric C., 4,273,838, Cl. 428-683.000.

ComCoach Corporation: *See—*
Anderson, Bruce H., 4,272,923, Cl. 49-360.000.
Commissariat a l'Energie Atomique: *See—*
Bompard, Bruno, 4,272,950, Cl. 57-232.000.
Pomie, Pierre; and Renaux, Charley, 4,273,614, Cl. 176-30.000.
Commonwealth Industrial Gases Limited, The: *See—*
McMahon, John B., 4,273,251, Cl. 220-361.000.
Communications Satellite Corporation: *See—*
Uzunoglu, Vasil, 4,274,067, Cl. 331-172.000.
Compton, James, Jr.: *See—*
Herzberg, Norman; and Compton, James, Jr., 4,273,170, Cl. 144-115.000.
Conageski, Raymond H.; and Paciotti, Joseph D., to Du Pont de Nemours, E. I., and Company. Two-stage flotation purification of NaOH. 4,273,657, Cl. 210-703.000.
Conca, Gilbert G., to Societe Anonyme dite: Transitube-Project. Device for extracting and proportioning pulverulent products. 4,273,267, Cl. 222-318.000.
Concept Development Institute, Inc.: *See—*
Morgan, Burton D., 4,273,099, Cl. 126-426.000.
Condon, Joseph H., to Bell Telephone Laboratories, Incorporated. Electromagnetic arrangement for measuring electrical current. 4,274,051, Cl. 324-117.00R.
Congoleum Corporation: *See—*
Schmidle, Claude J.; and Varadhachary, Seevaram N., 4,273,819, Cl. 428-159.000.
Conklin, Charles W., to C&D Enterprises. Glow plug driver. 4,274,034, Cl. 315-240.000.
Conrad Scholtz AG: *See—*
Blattermann, Karl-Gunther; Neuhaus, Gunter; and Nolte, Gunther, 4,273,238, Cl. 198-605.000.
Conti-Form Machine Tools Limited: *See—*
LLoyd, William M.; and Lloyd, Brian M., 4,273,482, Cl. 409-80.000.
Contran Conveyors & Systems, Inc.: *See—*
Thwaites, John A.; and Ferrara, Ronald A., 4,273,239, Cl. 198-781.000.
Cook, James A., Jr., to PPG Industries, Inc. Process for preparing chlorothiolformates. 4,273,725, Cl. 260-455.00R.
Cooper, Michael N., to Knogo Corporation. Detection of articles in adjacent passageways. 4,274,090, Cl. 340-572.000.
Copal Company Limited: *See—*
Arisaka, Kunio; and Namioka, Kenta, 4,273,429, Cl. 354-30.000.
Corbett, Robert A.: *See—*
Clark, Colin R.; Shore, Arthur R.; and Corbett, Robert A., 4,273,071, Cl. 119-17.000.
Cordrey, Robert E.: *See—*
Giordano, George P.; Cordrey, Robert E.; and Eberts, Allen F., 4,272,916, Cl. 46-253.000.
Corley, John E.; Mitchell, Joseph M.; and Andert, Charles M., to McDonnell Douglas Corporation. Hydraulic stop. 4,273,481, Cl. 408-14.000.
Corning Glass Works: *See—*
Flannery, James E.; Morgan, David W.; Rosplock, Sara E.; and Sczerbaniewicz, Stella A., 4,273,586, Cl. 106-52.000.
Scholl, John J.; and Staley, Warren D., 4,273,567, Cl. 65-72.000.
Scholl, John J.; and Staley, Warren D., 4,273,568, Cl. 65-76.000.
Staley, Warren D., 4,273,569, Cl. 65-360.000.
Corrigan, James H.; and Jahnsen, Egil J., to Falconbridge Nickel Mines Limited. Electric arc furnace operation. 4,273,576, Cl. 75-11.000.
Corris, Charles J.: *See—*
Beck, Blaine E.; and Corris, Charles J., 4,274,127, Cl. 362-72.000.
Cottell, Eric C. Fuel supply system. 4,273,078, Cl. 123-25.00R.
Coulter Electronics, Inc.: *See—*
Hogg, Walter R., 4,273,443, Cl. 356-343.000.
Coussediere, Daniel, to Roussel Uclaf. Novel $\Delta^{4,9}$-gonadiene-21-ol-3,20-diones. 4,273,771, Cl. 424-242.000.
Couturier, Bernard: *See—*
Peronnet, Roland; Couturier, Bernard; and Fombert, Christian, 4,273,603, Cl. 156-236.000.
Cowden, Ernest A.; and Lauber, Leo E., to Clear Corporation, The. Panel structure for blocking windows. 4,272,934, Cl. 52-202.000.
Cowpland, Michael C. J.; and Beirne, Patrick R., to Mitel Corporation. Tone decoding circuit. 4,273,965, Cl. 179-84.0VF.
CPC Engineering Corporation: *See—*
Reid, Robert A., 4,273,655, Cl. 210-396.000.
CPG Products Corp.: *See—*
Giordano, George P.; Cordrey, Robert E.; and Eberts, Allen F., 4,272,916, Cl. 46-253.000.
Crane, Walton B., to Industrial Designs & Services. Method and device for folding blanks to form boxes. 4,273,548, Cl. 493-162.000.
Cranjer Company, Inc.: *See—*
Rio, Gerald J., 4,273,311, Cl. 254-93.00R.
Cremo Supply Ltd.: *See—*
Cronk, Allan D., 4,273,467, Cl. 404-26.000.
Creusot-Loire: *See—*
Pere, Gerard, 4,273,641, Cl. 204-253.000.
Crews, Sam T.: *See—*
Bolton, Jimmie B.; and Crews, Sam T., 4,273,159, Cl. 138-109.000.
Cribbs, Robert W., to Litton Industrial Products, Inc. Scanning method and apparatus. 4,272,991, Cl. 73-621.000.
Crivello, James V., to General Electric Company. Arylsulfonium salt-solvent mixtures. 4,273,668, Cl. 252-182.000.
Cronewitz, Theodor; and Schiweck, Hubert, to Suddeutsche Zucker-Aktiengesellschaft. Process for obtaining pressed beet pulp with high dry-substance content. 4,273,590, Cl. 127-44.000.
Cronk, Allan D., to Cremo Supply Ltd. Adjustable manhole cover support. 4,273,467, Cl. 404-26.000.
Crosby, Jeffrey N.: *See—*
Rhoda, Richard N.; and Crosby, Jeffrey N., 4,273,755, Cl. 423-463.000.
Cross, Clifford W.: *See—*
Lindsay, Ronald J.; and Cross, Clifford W., 4,273,065, Cl. 114-219.000.
Cross, Peter E.; and Dickinson, Roger P., to Pfizer Inc. Inhibition of thromboxane synthetase by 3-(1-Imidazolylalkyl) indoles. 4,273,782, Cl. 424-273.00R.
Crowder, Billy L.; Gaensslen, Fritz H.; and Jaeger, Richard C., to International Business Machines Corporation. MOSFET Substrate sensitivity control. 4,274,105, Cl. 357-23.000.
Crowhurst, Brian H. Food preparation appliances. 4,273,318, Cl. 269-13.000.
Crowley, Bucky, to Butler Greenwich Inc. Printing machine registration target. 4,273,045, Cl. 101-211.000.
Csermely, Gyorgy: *See—*
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Cuches, Walter T.: *See—*
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Cuk, Slobodan M.; and Middlebrook, Robert D., to California Institute of Technology. DC-to-DC Converter having reduced ripple without need for adjustments. 4,274,133, Cl. 363-39.000.
Cummins, Richard W.; Fuchs, Robert J.; and Thomas, James L., to FMC Corporation. Preparation of guanidine phosphate for hardboard flame retardant use. 4,273,687, Cl. 260-17.200.
Cuppleditch, Brian; and Lewis, Clive. Device for containing and dispensing particles such as tablets. 4,273,254, Cl. 221-196.000.
Curtis, James W.: *See—*
Renau, Jacques; Curtis, James W.; Nicholson, Donald S.; and Hennessey, Frank L., 4,274,098, Cl. 343-781.0CA.
Cusi, Dante S. Method and apparatus for stabilizing operation of a press. 4,273,035, Cl. 100-37.000.
Custer, Milton F.: *See—*
Holland, Kenneth M.; and Custer, Milton F., 4,273,115, Cl. 128-90.000.
Custom Made Packaging Inc.: *See—*
Tollette, Henry B., 4,273,816, Cl. 428-35.000.
Cutler, John H.: *See—*
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Cyfka, Tadeusz R., to Balfour Beatty Limited. Tunnelling shields and like moveable apparatus. 4,273,468, Cl. 405-132.000.
D. W. Zimmerman Mfg., Inc.: *See—*
Berko, Peter, 4,273,499, Cl. 414-626.000.
D'Agostino, Michael: *See—*
Foley, James P.; Klocek, Bernard F.; and D'Agostino, Michael, 4,273,969, Cl. 179-156.00A.
Daiichi Dentsu Kabushiki Kaisha: *See—*
Doniwa, Tabito, 4,273,198, Cl. 173-1.000.
Daimler-Benz AG: *See—*
Scholz, Hansjurgen; Backhaus, Hans-Gerd; and Brambilla, Luigi, 4,273,359, Cl. 280-740.000.
Daimler-Benz Aktiengesellschaft: *See—*
Beeskow, Bruno; Bauer, Egon; and Pfundstein, Wolfgang, 4,273,030, Cl. 91-450.000.
Gutjahr, Manfred A.; and Heinrich, Hans, 4,273,582, Cl. 75-222.000.
Reinhard, Theodor; Haug, Ernst; Hoffmann, Rudiger; and Feichtiger, Dieter, 4,273,027, Cl. 91-32.000.
Dainichi-Nippon Cables, Ltd.: *See—*
Okugawa, Michihide; and Ishii, Ryougi, 4,273,579, Cl. 75-106.000.
Damron, Tony R. Pressure-fluid supply system. 4,273,503, Cl. 414-694.000.
Danforth, Michael B. Method for making hyperextension orthosis. 4,272,878, Cl. 29-526.00R.
D'Angelo, Paul F.; and Metzler, Richard B., to Union Carbide Corporation. Detergent resistant compositions. 4,273,584, Cl. 106-3.000.
Daniels, Charles A.: *See—*
Bush, Charles N.; Daniels, Charles A.; and Koebel, Ralph F., 4,273,904, Cl. 526-91.000.
Danz, William R. Ocular prosthetic or the like. 4,272,910, Cl. 46-45.000.
Davert, Edward J., to Boeing Company, The. Lattice template. 4,272,890, Cl. 33-174.00G.
Davies, Robert B.: *See—*
Cave, David L.; and Davies, Robert B., 4,274,018, Cl. 307-300.000.
Davis, George B., Jr. Hand held electric caulking gun. 4,273,269, Cl. 222-326.000.
Davis, Odie R. S.: *See—*
Baker, Eugene E.; Szarka, David D.; Davis, Odie R. S.; and Workman, Nolan M., 4,273,190, Cl. 166-278.000.
Davy International AG: *See—*
Knobel, Walter, 4,273,620, Cl. 203-18.000.
Dawless, Robert K.; and Jacobs, Stanley C., to Aluminum Company of America. Production of extreme purity aluminum. 4,273,627, Cl. 204-67.000.
Dawson, Jean H., to United States of America, Agriculture. Method of applying herbicide. 4,272,920, Cl. 47-58.000.
Dawson, Robert H.; and Schnable, George L., to RCA Corporation. Passivating composite for a semiconductor device comprising a silicon nitride (Si_3N_4) layer and phosphosilicate glass (PSG) layer. 4,273,805, Cl. 427-88.000.

DBS, Inc.: *See—*
Strohschneider, Heinz F., 4,273,038, Cl. 101-45.000.
Deabriges, Jean; Ferre, Yves; and Goumont, Claude, to Eastman Kodak Company. Process of formation of color images, photographic product and treating solutions useful for putting the process into practice. 4,273,863, Cl. 430-467.000.
Dean, John J.: *See—*
Haydon, Arthur W.; and Dean, John J., 4,274,026, Cl. 310-254.000.
Deaton, Thomas M.: *See—*
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Deborah Fluidised Combustion Limited: *See—*
Robinson, Edwin, 4,273,073, Cl. 122-4.00D.
Decker, Peter W. Road surface ice detector and method for vehicles. 4,274,091, Cl. 340-583.000.
Decker, Richard H.: *See—*
Ling, Chung-Mei; Decker, Richard H.; and Claire, Ruben, 4,273,756, Cl. 424-1.000.
Deere & Company: *See—*
Dolberg, Dale R.; and Guiter, Jack L., 4,272,948, Cl. 56-246.000.
Pauli, Klaus H., 4,273,138, Cl. 130-27.00T.
Degen, Ludwig: *See—*
Robertiello, Andrea; and Degen, Ludwig, 4,273,659, Cl. 210-728.000.
De Groff, James T.: *See—*
Feldman, Martin L.; and De Groff, James T., 4,273,701, Cl. 260-40.00R.
de Lange, Tinus, to Wavin B.V. Branch piece. 4,273,364, Cl. 285-197.000.
Delatorre, Leroy C.: *See—*
Rapson, William J., Jr.; Delatorre, Leroy C.; and Thompson, Charles L., 4,272,985, Cl. 73-49.200.
Della Croce, John B. Method for constructing dentures. 4,273,533, Cl. 433-55.000.
De Long, Charles F., to United States Trading International, Inc. Anti-fouling overcoating composition and use thereof. 4,273,833, Cl. 428-411.000.
DeMag Aktiengesellschaft: *See—*
Middeldorf, Martin, 4,273,348, Cl. 280-112.00A.
Demerson, Christopher A.; Humber, Leslie G.; and Ferland, Jean-Marie, to American Home Products Corporation. Antihypertensive tricyclic isoindole derivatives. 4,273,773, Cl. 424-250.000.
Demoute, Jean-Pierre: *See—*
Martel, Jacques; Tessier, Jean; Teche, Andre; and Demoute, Jean-Pierre, 4,273,727, Cl. 260-465.00F.
DeNardo, John M. Guide for a cutting torch. 4,273,313, Cl. 266-66.000.
Dennison, Terry A. Aircraft proximity monitoring system. 4,274,096, Cl. 343-112.0TC.
Denny, John S.: *See—*
Maxcy, Thomas A.; and Denny, John S., 4,273,796, Cl. 426-634.000.
Dent, Thomas H.: *See—*
Lahoda, Edward J.; and Dent, Thomas H., 4,273,076, Cl. 122-382.000.
DeSoto, Inc.: *See—*
Porzel, Rita E.; and Bator, Cathryn D., 4,273,688, Cl. 260-17.40R.
Deubler, Josef. Process for the production of a liquid alkaline fertilizer containing clays and trace elements. 4,273,570, Cl. 71-21.000.
Deutsch, Ralph, to Kawai Musical Instrument Mfg. Co., Ltd. Nonlinear tone generation in a polyphonic tone synthesizer. 4,273,018, Cl. 84-1.220.
Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Nauroth, Peter; Esch, Heinz; Kuhlmann, Robert; Bode, Rudolf; Reisert, Arthur; Buhler, Harald; and Turk, Gunter, 4,273,589, Cl. 106-308.00Q.
Devanney, Raymond H., to Veeder Industries Inc. Fuel pump counter transfer pinion. 4,273,995, Cl. 235-139.00R.
De Voogd, Albert H., to Maatschappij van Berkel's Patent N.V. Clamping device for oscillatory strings in a weight sensing cell for a weighing apparatus. 4,273,205, Cl. 177-210.0FP.
De Zuba, George P.: *See—*
Smith, Alfred H., Jr.; De Zuba, George P.; and Mitchell, Tyrone D., 4,273,698, Cl. 260-37.0SB.
Diamant Boart: *See—*
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Diamond Shamrock Corp.: *See—*
Kidon, William E.; Shuster, Nicholas; and Babinsky, Andrew D., 4,273,628, Cl. 204-87.000.
Dickhart, William W., III; and Marvin, Richard H., to Budd Company, The. Railway car trap door lift. 4,273,498, Cl. 414-556.000.
Dickinson, Roger P.: *See—*
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Dickson, John D.: *See—*
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Diekhoner, Gunther: *See—*
Birkhofer, Herbert; Diekhoner, Gunther; and Hoffler, Hans-Otto, 4,273,280, Cl. 227-107.000.
Diesel Kiki Co., Ltd.: *See—*
Shibuya, Tsunenori, 4,273,518, Cl. 417-269.000.
Takefuta, Hideyasu; Shinoda, Akira; and Shibauta, Teruyoshi, 4,273,226, Cl. 192-35.000.
Diethelm, Eugen, to Grissman Chemicals Limited. (1-Alkyl-5-nitro-2-imidazolyl)-vinyl-glyoxal-diacetals, their preparation and their use. 4,273,783, Cl. 424-273.00R.
Dietrich, Robert, to J. M. Voith GmbH. Stone roller. 4,272,873, Cl. 29-123.000.
Dikhashidze, Manana A.: *See—*
Aladiev, Ivan T.; Dzhamardzhashvili, Vazha A.; Dikhashidze, Manana A.; Teplov, Sergei V.; and Tskhvirashvili, David G., 4,274,019, Cl. 310-11.000.
Dill, Randy B. Therapist's patient evaluation and training device. 4,273,540, Cl. 434-262.000.
Direct Reduction Corporation, The: *See—*
Keran, Vitie P.; and Baker, Alan C., 4,273,314, Cl. 266-145.000.
Discovision Associates: *See—*
Hayward, Curtis E.; and Maurer, Friedhelm, 4,274,119, Cl. 360-97.000.
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Dobersch, Gerhard. Steel tube scaffold. 4,273,463, Cl. 403-246.000.
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Cheng, Peter J.; Dockendorff, Jay D.; and Wright, Ernest L., 4,273,670, Cl. 252-301.10W.
Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See—*
Sivers, Rolf V.; Herrmann, Rudolf; and Layher, Ulrich, 4,273,207, Cl. 180-70.00P.
Dr. Johannes Heidenhain GmbH: *See—*
Nelle, Gunther, 4,273,447, Cl. 356-373.000.
Dodds, Philip V. W.; and Smith, Mark L., to ARP Instruments, Inc. Piano action keyboard with roller and elastic diaphragm transducer. 4,273,017, Cl. 84-1.100.
Dodonov, Jury I.; and Obidina, Valentina F. High power liquid cooled double strapped vane type magetron. 4,274,032, Cl. 315-39.510.
Dohring, Edward F.: *See—*
Hewelt, Robert K.; and Dohring, Edward F., 4,273,435, Cl. 354-299.000.
Dolberg, Dale R.; and Guiter, Jack L., to Deere & Company. Oscillating knife cutting apparatus. 4,272,948, Cl. 56-246.000.
Dominguez, Richard J. G., to Texaco Inc. Stable emulsions of polyols and crosslinkers for polyurethanes. 4,273,884, Cl. 521-114.000.
Dominguez, Richard J. G.; and Rice, Doris M., to Texaco Development Corp. Novel catalyst system for RIM elastomers. 4,273,885, Cl. 521-115.000.
Doniwa, Tabito, to Daiichi Dentsu Kabushiki Kaisha. Motor-driven clamping method and device. 4,273,198, Cl. 173-1.000.
Doorley, Richard B.: *See—*
Woolner, John H.; Gaslevic, Emeric; and Doorley, Richard B., 4,273,052, Cl. 104-17.00R.
Dorr, John A.; and Nomm, Matt, to Westinghouse Electric Corp. Oil and gas well kick detector. 4,273,212, Cl. 181-102.000.
Dorries, Peter: *See—*
Piesch, Steffen; Dorries, Peter; Schmidt, Ewald; and Hensel, Richard, 4,273,669, Cl. 252-182.000.
Dostoomian, A. S.; and Traub, Alan C., to Vanzetti Infrared & Computer Systems, Inc. Luminous clock display using optical fibers. 4,274,154, Cl. 368-82.000.
Dotsch, Erwin; Potschke, Jurgen; and Knacke, Ottmar, to Brown, Boveri & Cie Aktiengesellschaft. Method for preventing sintering in forging blocks. 4,273,810, Cl. 427-156.000.
Dow Chemical Company, The: *See—*
Bertram, James L.; and Sheih, Pong Su, 4,273,921, Cl. 528-405.000.
Ezzell, Bobby R.; and Sorenson, Marius W., 4,273,626, Cl. 204-98.000.
Gibbs, Dale S.; Benson, Jack H.; and Fernandez, Reet T., 4,273,901, Cl. 525-455.000.
Heitz, Robert G., 4,274,043, Cl. 320-6.000.
Lane, George A.; and Rossow, Harold E., 4,273,666, Cl. 252-70.000.
Dow Corning Corporation: *See—*
Meddaugh, Michael D., 4,273,813, Cl. 427-387.000.
Saam, John C.; and Wegener, Robert L., 4,273,634, Cl. 204-159.150.
Downen, Jim L.: *See—*
Sutliff, Wayne N.; and Downen, Jim L., 4,273,520, Cl. 417-434.000.
Downs, James W. Random conductive roving reflective surfacing for antennas and guides. 4,274,099, Cl. 343-912.000.
Doyle, William D., to Sperry Corporation. Passive bubble generator. 4,273,801, Cl. 427-48.000.
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Phillips, William R., Jr.; Tate, Ronald D.; and Tolman, Radon, 4,273,312, Cl. 266-44.000.
Drell, Philip, to Sima Products Corporation. Device for supporting and preventing curling of photographic film during developing thereof. 4,273,436, Cl. 354-344.000.
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Graham, Richard B., 4,272,952, Cl. 59-84.000.
Drive Manufacturing Inc.: *See—*
Bytzek, Klaus K., 4,273,547, Cl. 474-170.000.
Dual Gebruder Steidinger: *See—*
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Duguet, Pierre; and Robert, Christian, to Automobiles Peugeot; and Societe Anonyme Automobiles Citroen. Convertible seat structures for automobile vehicles. 4,273,376, Cl. 296-65.00R.
Dulux Australia Limited: *See—*
Gillan, John; and Richards, Colin M., 4,273,830, Cl. 428-398.000.

Du Pont de Nemours, E. I., and Company: *See—*
Berry, Kenneth L., 4,273,807, Cl. 427-132.000.
Conageski, Raymond H.; and Paciotti, Joseph D., 4,273,657, Cl. 210-703.000.
Greene, Robin N.; and Hertler, Walter R., 4,273,695, Cl. 260-29.4UA.
Krespan, Carl G., 4,273,728, Cl. 260-465.600.
Krespan, Carl G., 4,273,729, Cl. 260-543.00F.
Leberzammer, Ernst; and Roos, Leo, 4,273,857, Cl. 430-281.000.
Tyran, Leo W., 4,273,583, Cl. 75-251.000.
Walus, Aloysius N., 4,273,690, Cl. 260-22.0CB.

Durafab Division of Texel Industries, Inc.: *See—*
Goldstein, Lynn E., 4,272,851, Cl. 2-79.000.

Dybas, Richard A.: *See—*
Grier, Nathaniel; Dybas, Richard A.; and Witzel, Bruce E., 4,273,781, Cl. 424-267.000.

Dyform Engineering Limited: *See—*
Bunn, Norman W.; and Bunn, Christopher B., 4,273,522, Cl. 425-113.000.

Dzhamardzhashvili, Vazha A.: *See—*
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E.N.I. Ente Nazionale Idrocarburi: *See—*
Robertiello, Andrea; and Degen, Ludwig, 4,273,659, Cl. 210-728.000.

E.R.E. Europe Representation Establishment: *See—*
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E. R. Squibb & Sons, Inc.: *See—*
Hoehn, Hans, 4,273,776, Cl. 424-263.000.

E. T. Oakes Limited: *See—*
Baker, Donald E.; and Bouette, David W., 4,273,521, Cl. 418-48.000.

Earls, William L., to Schenley Industries, Inc. Bottle closure-cup assembly. 4,273,247, Cl. 215-228.000.

Eastman Kodak Company: *See—*
Adin, Anthony, 4,273,860, Cl. 430-338.000.
Chapman, Derek D.; and Wu, E-ming, 4,273,706, Cl. 260-156.000.
Deabriges, Jean; Ferre, Yves; and Goumont, Claude, 4,273,863, Cl. 430-467.000.
Frishberg, Mark D., 4,273,926, Cl. 542-458.000.
Gottermeier, William F., 4,273,639, Cl. 204-195.00R.
Kilminster, Kenneth N.; and Holstead, Colin, 4,273,708, Cl. 260-199.000.
Lange, Gerald A.; and Simpson, Charles J., 4,273,852, Cl. 430-209.000.
Merrill, Stewart H.; Mutz, Alec N.; and Stahly, Frederick A., 4,273,849, Cl. 430-119.000.
Ponticello, Ignazio S.; Sniadoch, Henry J.; and Villard, George, 4,273,853, Cl. 430-213.000.

Eastman Whipstock, Inc.: *See—*
Scott, Anthony C., 4,273,464, Cl. 403-348.000.

Eaton Corporation: *See—*
Butterworth, Edmund M., 4,273,972, Cl. 200-6.00A.
Hansen, James E.; and Heinz, Jerome G., 4,274,122, Cl. 361-159.000.

Ebato, Seigo: *See—*
Yoshida, Akio; and Ebato, Seigo, 4,273,862, Cl. 430-412.000.

Eberts, Allen F.: *See—*
Giordano, George P.; Cordrey, Robert E.; and Eberts, Allen F., 4,272,916, Cl. 46-253.000.

Economy, James; and Flandera, Mary Ann, to International Business Machines Corporation. Polymerizable acetylenic oligomers. 4,273,906, Cl. 526-285.000.

Edling, Ernst G. S., to Molnlycke AB. Device for cutting out blanks from a web of material. 4,273,014, Cl. 83-333.000.

Edman, Walter W.: *See—*
Klemm, Ernest J.; Edman, Walter W.; Erskine, Frances E.; and McDonough, Everett G., 4,273,143, Cl. 132-7.000.

Edson, Donald; and Carter, Albert W., to Blacks Equipment Limited. Method and apparatus for arc butt welding. 4,273,986, Cl. 219-123.000.

Edwards, Allen W. Automatic air register. 4,273,283, Cl. 236-49.000.

Edwards, Donald W.; Young, Paul R.; and Zukovich, Thomas M., to International Minerals & Chemical Corp. Method of blasting a field with ANFO and TL-136. 4,273,049, Cl. 102-312.000.

Efamol Limited: *See—*
Horrobin, David F., 4,273,763, Cl. 424-145.000.

Eheim, Franz: *See—*
Hofer, Gerald; Konrath, Karl; Eheim, Franz; Weiss, Otmar; Schmitt, Edgar; Faupel, Werner; and Gotz, Edgar, 4,273,090, Cl. 123-502.000.

Eijsermans, Petrus A. H., to B.V. Arenco P.M.B. Device for spreading individual tobacco leaf halves. 4,273,140, Cl. 131-328.000.

Eimerman, Allen C.: *See—*
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Ekeborg, Bo G.: *See—*
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Ekman, C. Frederick W.: *See—*
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Ekstrom, Olov; and Nilsson, Kenth, to Siemens Aktiengesellschaft. Two-part fluid conduit with means for connecting the sections thereof. 4,273,366, Cl. 285-332.000.

Elam, James O.: *See—*
Barkalow, Clare E.; and Elam, James O., 4,273,114, Cl. 128-53.000.

Electric Power Research Institute, Inc.: *See—*
MacDonald, Digby D.; and Scott, Arthur C., 4,273,637, Cl. 204-195.00F.
Rostron, Joseph R., 4,273,978, Cl. 200-148.00R.

Electro-Optik GmbH & Co. K.G.: *See—*
Menke, Josef F., 4,273,410, Cl. 350-6.200.

Eli Lilly and Company: *See—*
Nevin, Robert S., 4,273,920, Cl. 528-361.000.

Elliott, John B. Combination flashlight and high intensity light source. 4,274,130, Cl. 362-184.000.

Elliott, Michael T.: *See—*
Glass, Howard L.; and Elliott, Michael T., 4,273,610, Cl. 156-624.000.

Elsel, Werner, to Siemens Aktiengesellschaft. Evacuating device for generating an insulating vacuum around the superconducting winding of a rotor. 4,274,022, Cl. 310-62.000.

Elsner, Paul: *See—*
Wahl, Alois; Elsner, Paul; and Born, Gerhard, 4,273,236, Cl. 198-432.000.
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Emerson Electric Co.: *See—*
Seeley, Wayne R., 4,273,993, Cl. 219-541.000.
Steiner, Robert E.; and Long, Thomas J., 4,273,990, Cl. 219-363.000.

Emtek Incorporated: *See—*
Solomon, Harold W., 4,273,650, Cl. 210-104.000.

Enderby, Charles E., to Cavitron Corporation. Fiber optic light delivery apparatus and medical instrument utilizing same. 4,273,109, Cl. 128-6.000.

Endo, Ichiro: *See—*
Kobayashi, Hajime; Yano, Yasuhiro; and Endo, Ichiro, 4,273,844, Cl. 430-48.000.
Kobayashi, Hajime; Yano, Yasuhiro; and Endo, Ichiro, 4,273,845, Cl. 430-48.000.

Endo, Makoto; and Kusahara, Kohji, to Nissan Chemical Industries Ltd. Process for producing aqueous solution of calcium nitrite. 4,273,754, Cl. 423-385.000.

Endter, Horst, to Maschinenfabrik Hasenclever Gesellschaft mit beschrankter Haftung. Workpiece manipulator for forging press. 4,272,981, Cl. 72-405.000.

Energy Development Associates, Inc.: *See—*
Carr, Peter; and Laethem, Alfred F., 4,273,839, Cl. 429-51.000.

Energy and Pollution Controls, Inc.: *See—*
Hollett, Grant T., Jr.; and Flick, Francis S., 4,273,750, Cl. 423-244.000.

Enertek Energy Engineering Inc.: *See—*
Methvin, James, 4,273,107, Cl. 126-445.000.

Engine Technology, Inc.: *See—*
McCusker, James D., 4,273,543, Cl. 440-4.000.

Engineered Systems, Inc.: *See—*
Weimer, Dan G., 4,273,996, Cl. 235-435.000.

Envirotech Corporation: *See—*
Mar, Danny M., 4,273,558, Cl. 23-230.0PC.

Epoxy Technology Inc.: *See—*
Tamulevich, Thomas W., 4,272,926, Cl. 51-216.00R.

EPP Corp.: *See—*
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Erickson, John W.; Brown, F. Barton; and White, Thomas A., Jr., to Kobe, Inc. Self-powered cleaning unit for a fluid pump. 4,273,509, Cl. 415-111.000.

Ernst Leitz Wetzlar GmbH: *See—*
Fritsche, Rainer; and Schaefer, Klaus-Dieter, 4,273,430, Cl. 354-31.000.

Erskine, Frances E.: *See—*
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Esch, Heinz: *See—*
Nauroth, Peter; Esch, Heinz; Kuhlmann, Robert; Bode, Rudolf; Reisert, Arthur; Buhler, Harald; and Turk, Gunter, 4,273,589, Cl. 106-308.00Q.

Ess-Food Eksport-Svineslagteriernes Salgsforening: *See—*
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Essex Group, Inc.: *See—*
Maier, Thomas A., 4,273,089, Cl. 123-417.000.

Etsusaki, Yuji; and Hayakawa, Shunichi, to Kabushiki Kaisha Komatsu Seisakusho. Automatic control system for maintaining blade in predetermined relationship to laser beam. 4,273,196, Cl. 172-4.500.

Euerle, Karl. Back-pressure valve for heating installations. 4,273,155, Cl. 137-543.170.

Evdokimov, Viktor G.: *See—*
Fomichev, Mikhail M.; Schepakin, Mikhail B.; Gudz, Anatoly G.; Evdokimov, Viktor G.; Lukianov, Nikolai E.; Romanchenko, Irina A.; and Salnikov, Andrei F., 4,273,508, Cl. 415-1.000.

Ex-Cell-O Corporation: *See—*
Scholbrock, Sylvanus L., 4,273,285, Cl. 239-121.000.

Exner, Gerhard; and Festinori, Volfango, to Kraftwerk Union Aktiengesellschaft. Device for turning the nuts on studs for closing a pressure vessel. 4,273,011, Cl. 81-57.380.

Exxon Production Research Company: *See—*
Karman, James S., 4,273,658, Cl. 210-709.000.

Exxon Research & Engineering Co.: *See—*
Anagnostopoulos, Stavros M., 4,273,454, Cl. 400-234.000.

Barnett, Allan E.; and Halluin, Albert P., 4,273,939, Cl. 564-358.000.
Halluin, Albert P.; and Barnett, Allan E., 4,273,680, Cl. 252-466.00J.
Krohn, David A.; Snitzer, Elias; and Raber, Peter E., 4,273,585, Cl. 106-47.00R.
Kugler, Edwin L.; and Garten, Robert L., 4,273,724, Cl. 518-715.000.
Levenspiel, Octave; and Kamholz, Kenneth, 4,272,893, Cl. 34-1.000.
Worley, Arthur C., 4,273,565, Cl. 55-343.000.

Ezzell, Bobby R.; and Sorenson, Marius W., to Dow Chemical Company, The. Electrolyte series flow in electrolytic chlor-alkali cells. 4,273,626, Cl. 204-98.000.

Fachin, Gino: *See*—
Marchesi, Sergio; and Fachin, Gino, 4,273,740, Cl. 264-228.000.

Fadda, Jean; and Pernet, Jean P., to Automobiles M. Berliet. Cooling system for an internal combustion engine. 4,273,563, Cl. 55-189.000.

Fahey, Robert J.; and Resnick, Martin L., to GTE Products Corporation; and GTE Laboratories Incorporated. Apparatus for monitoring usage of a telephone. 4,273,960, Cl. 179-5.00R.

Falconbridge Nickel Mines Limited: *See*—
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Fang, Frank F.; and Hung, Roland Y., to International Business Machines Corporation. Electrooptical integrated circuit communication. 4,274,104, Cl. 357-19.000.

Fardo, Obie L.: *See*—
Griffin, Dennis B.; and Fardo, Obie L., 4,272,862, Cl. 17-21.000.

Fariel, Harry F.; Rudolph, Marvin J.; Hynson, Richard B.; Roy, Pradip K.; and Kleiner, Fredric, to General Foods Corporation. Apparatus and process for the preparation of gasified confectionaries by pressurized injection molding. 4,273,793, Cl. 426-572.000.

Faris, Sadeg M., to International Business Machines Corporation. Self-resetting Josephson digital current amplifier. 4,274,015, Cl. 307-264.000.

Farmer, Zane M.; and Yobaccio, Edward A., to Polaroid Corporation. Adapter for coupling a photographic camera with a viewing device. 4,273,431, Cl. 354-59.000.

Farnham, Stewart E., to Bell & Howell Company. Information recording methods and apparatus. 4,274,120, Cl. 360-106.000.

Farr, Garth M.; McCoy, Terence D.; and Dlask, Jiri. Power tong. 4,273,010, Cl. 81-57.180.

Farr, Glyn P. R., to Lucas Industries Limited. Control valve assemblies. 4,273,386, Cl. 303-6.00C.

Farr, Glyn P. R., to Girling Limited. Pumps for fluids. 4,273,516, Cl. 417-214.000.

Faupel, Werner: *See*—
Hofer, Gerald; Konrath, Karl; Eheim, Franz; Weiss, Otmar; Schmitt, Edgar; Faupel, Werner; and Gotz, Edgar, 4,273,090, Cl. 123-502.000.

Favin, David L.; Lynn, Peter F.; and Snyder, Paul J., to Bell Telephone Laboratories, Incorporated. Intermodulation distortion test. 4,273,970, Cl. 179-175.30R.

Fazekas, Ernest E.: *See*—
Bayly, William I.; Rumbolo, Louis J.; Fazekas, Ernest E.; and Korzeb, Frank, 4,273,493, Cl. 414-221.000.

Feder, Joseph: *See*—
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Fee, Robert W.: *See*—
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Feichtiger, Dieter: *See*—
Reinhard, Theodor; Haug, Ernst; Hoffmann, Rudiger; and Feichtiger, Dieter, 4,273,027, Cl. 91-32.000.

Feiger, Jerrold C. Vehicle cover and alarm system therefor. 4,274,077, Cl. 340-63.000.

Feinberg, Irving; and Wu, Leon L., to International Business Machines Corporation. Thick film capacitor having very low internal inductance. 4,274,124, Cl. 361-275.000.

Feldman, Martin L.; and De Groff, James T., to Tenneco Chemicals, Inc. Colorant-thickener dispersions for unsaturated polyester resin compositions. 4,273,701, Cl. 260-40.00R.

Feldmann, Rainer; Muller, Karl-Adolf; and Hornung, Karl-Heinz, to Chemische Werke Huls Aktiengesellschaft. Method for producing polylaurolactam powder compositions for the coating of metals at high temperatures and their use in the manufacture of pigmented powders by the dry-blend process. 4,273,919, Cl. 528-313.000.

Feldmesser, Julius: *See*—
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Feldstein, Nathan. Process using activated electroless plating catalysts. 4,273,804, Cl. 427-97.000.

Feltenberger, Bruce D. Tide generator. 4,274,008, Cl. 290-42.000.

Ferakarn Limited: *See*—
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Ferland, Jean-Marie: *See*—
Demerson, Christopher A.; Humber, Leslie G.; and Ferland, Jean-Marie, 4,273,773, Cl. 424-250.000.

Fernandez-Moran Villalobos, Humberto. Ultrasharp polycrystalline diamond edges, points, and improved diamond composites, and methods of making and irradiating same. 4,273,561, Cl. 51-307.000.

Fernandez, Reet T.: *See*—
Gibbs, Dale S.; Benson, Jack H.; and Fernandez, Reet T., 4,273,901, Cl. 525-455.000.

Ferodo Limited: *See*—
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Ferrara, Ronald A.: *See*—
Thwaites, John A.; and Ferrara, Ronald A., 4,273,239, Cl. 198-781.000.

Ferraro, Armand J.: *See*—
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Ferraro, Frank A., to Warner-Lambert Company. Shaving cartridge. 4,272,885, Cl. 30-47.000.

Ferre, Yves: *See*—
Deabriges, Jean; Ferre, Yves; and Goumont, Claude, 4,273,863, Cl. 430-467.000.

Festinori, Volfango: *See*—
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F'Geppert, Erwin, to United States of America, Army. Drive mechanism. 4,272,998, Cl. 74-99.00R.

Fiato, Rocco A.; and Pruett, Roy L., to Union Carbide Corporation. Rhodium-catalyzed oxidation process for producing carboxylic acids. 4,273,936, Cl. 562-606.000.

Fichtel & Sachs AG: *See*—
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Finch, Neville, to Ciba-Geigy Corporation. Treating hypertension with substituted-5-amino-2-pyridinecarboxylic acids. 4,273,779, Cl. 424-266.000.

Firmenich, S.A.: *See*—
Becker, Joseph J., 4,273,714, Cl. 260-343.210.

Fischer, Michael A.; and Pepi, Jerome S., to Grinnell Fire Protection Systems Company, Inc. Fire protection sprinkler head with air-current diverting fins. 4,273,195, Cl. 169-39.000.

Fischer, Otto; Pulvermacher, Wilfried; and Koch, Bernd, to Fried. Krupp Huttenwerke Aktiengesellschaft. Arc furnace roof. 4,273,949, Cl. 13-35.000.

Fischer, Werner. Tennis-racket. 4,273,331, Cl. 273-73.00D.

Fischer, Wolfgang; and Brown, William J., to PPG Industries, Inc. Semi-trailer shipping support structure. 4,273,485, Cl. 410-34.000.

Fisher, Albert W., to RCA Corporation. Method of laying out an integrated circuit with specific alignment of the collector contact with the emitter region. 4,272,882, Cl. 29-578.000.

Fitch, James B., to General Signal Corporation. Liquid ring pump. 4,273,515, Cl. 417-62.000.

FitzGerald, Joseph M.: *See*—
White, Jack H.; and FitzGerald, Joseph M., 4,272,967, Cl. 62-236.000.

Flanagan, Charles E. Binocular device for displaying elapsed time in the field of view. 4,274,149, Cl. 368-10.000.

Flandera, Mary Ann: *See*—
Economy, James; and Flandera, Mary Ann, 4,273,906, Cl. 526-285.000.

Flannery, James E.; Morgan, David W.; Rosplock, Sara E.; and Szczerbaniewicz, Stella A., to Corning Glass Works. Tinted glassware. 4,273,586, Cl. 106-52.000.

Fleek, Arthur E.: *See*—
Bolcavage, Richard D.; Ferraro, Armand J.; and Fleek, Arthur E., 4,273,041, Cl. 101-93.140.

Fleischer, Donald W., to Veeder Industries Inc. Rotary electromagnetic indicator. 4,273,994, Cl. 235-92.00A.

Flick, Francis S.: *See*—
Hollett, Grant T., Jr.; and Flick, Francis S., 4,273,750, Cl. 423-244.000.

Fliege, Werner: *See*—
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Florian, John, to Mobil Oil Corporation. Sandwich container. 4,273,249, Cl. 220-4.00E.

Fluid Data Systems: *See*—
Glassey, Gene; and Gomez, Aldan D., 4,274,039, Cl. 318-678.000.

FMC Corporation: *See*—
Berkowitz, Sidney, 4,273,928, Cl. 544-190.000.
Cummins, Richard W.; Fuchs, Robert J.; and Thomas, James L., 4,273,687, Cl. 260-17.200.
Jensen, Lyle B.; and Wittman, Leroy L., 4,273,244, Cl. 212-181.000.
Piazza, Andre L.; Krenek, Michael J.; and Ames, Thomas J., 4,273,472, Cl. 405-211.000.

Foerster, Hans-Juergen: *See*—
Merger, Franz; and Foerster, Hans-Juergen, 4,273,934, Cl. 560-238.000.

Foley, James P.; Kloek, Bernard F.; and D'Agostino, Michael, to Roanwell Corporation. Communications headset mountable over the ear. 4,273,969, Cl. 179-156.00A.

Foley, Michael S.; and Pierson, Mark V., to USM Corporation. Automatic component dispensor. 4,273,393, Cl. 312-97.100.

Fombert, Christian: *See*—
Peronnet, Roland; Couturier, Bernard; and Fombert, Christian, 4,273,603, Cl. 156-236.000.

Fomichev, Mikhail M.; Schepakin, Mikhail B.; Gudz, Anatoly G.; Evdokimov, Viktor G.; Lukianov, Nikolai E.; Romanchenko, Irina A.; and Salnikov, Andrei F. Method for automatic control of power plant and power plant of compressor station of gas pipeline system, wherein said method is effected. 4,273,508, Cl. 415-1.000.

Fontaine, Marc F.: *See*—
Saadeh, Fuad T.; and Fontaine, Marc F., 4,273,192, Cl. 166-312.000.

Ford Motor Company: *See*—
Cairns, Thomas M., 4,273,403, Cl. 339-91.00R.
Strutt, Derek W., 4,273,005, Cl. 74-492.000.

Winterhalter, Donald L.; and Perkey, Conrad G., 4,273,182, Cl. 164-137.000.
Fornoff, Louis L., to Lummus Company, The. Process for dehydrating ethanol and for the production of gasohol therefrom. 4,273,621, Cl. 203-19.000.
Forster, Rolf: *See*—
Kotulla, Bernhard; Haas, Hans; Weiser, Martin; Forster, Rolf; Preis, Lothar; and Schmidt, Rudolf, 4,273,476, Cl. 405-258.000.
Forsythe, Glenn: *See*—
Phillips, Paul S.; and Forsythe, Glenn, 4,273,202, Cl. 175-385.000.
Fortunato, Gilbert J. Plastic cesta. 4,273,339, Cl. 273-326.000.
Foster, Manford H., to Smith, Roy H., Jr. Modular housing system. 4,272,930, Cl. 52-79.100.
Frame, Norman J., to W. H. Brady Company. Ultraviolet light generation. 4,274,028, Cl. 313-101.000.
Francis, Grosvenor F.: *See*—
Maher, Jack; and Francis, Grosvenor F., 4,272,946, Cl. 56-13.500.
Francklyn, Gilbert W. Crab pot handling apparatus and method. 4,272,904, Cl. 43-4.500.
Frankila, John W., to Allied Chemical Corporation. Seat belt retractor with emergency release and reduced spooling. 4,273,301, Cl. 242-107.200.
Franks, Gerald N.; and Franks, Mae P. Rotary lawn mower edging attachment. 4,272,949, Cl. 56-255.000.
Franks, Mae P.: *See*—
Franks, Gerald N.; and Franks, Mae P., 4,272,949, Cl. 56-255.000.
Freeburn, Lewis R. Vehicle-towed roadway grinding machine. 4,273,384, Cl. 299-41.000.
Freeman, Murray E. Control valve assembly with onstream seal removal feature. 4,273,152, Cl. 137-315.000.
Freihage, Dean A. Heat generating device. 4,273,075, Cl. 122-26.000.
Freistadt, Margo S. Convertible handbag and backpack. 4,273,274, Cl. 294-141.000.
French, Jean G.: *See*—
Hinton, David O.; and French, Jean G., 4,273,989, Cl. 219-211.000.
Freudenberg, Bertram; Schuhmacher, Gunter; and Muhlfeld, Horst, to Carl Freudenberg, Firma. Method for the manufacture of low-melting polyurethanes having improved strength properties using a mixture of a polydiol having a molecular weight between 500 and 5,000 and a mixture of at least three diols. 4,273,911, Cl. 528-49.000.
Frey, Otto, to Sulzer Brothers Limited. Anchoring surface for a bone implant. 4,272,855, Cl. 3-1.900.
Fried. Krupp Huttenwerke Aktiengesellschaft: *See*—
Fischer, Otto; Pulvermacher, Wilfried; and Koch, Bernd, 4,273,949, Cl. 13-35.000.
Frishberg, Mark D., to Eastman Kodak Company. Azo dyes from 2-amino-5-styryl-1,3,4-thiadiazoles. 4,273,926, Cl. 542-458.000.
Fritsche, Rainer; and Schaefer, Klaus-Dieter, to Ernst Leitz Wetzlar GmbH. Photographic camera. 4,273,430, Cl. 354-31.000.
Fritz Buser Maschinenfabrik AG: *See*—
Hess, Anton; and Bellot, Ramon, 4,272,872, Cl. 29-113.00R.
Froessl, Horst. Method and apparatus for data collection and preparation. 4,273,440, Cl. 355-40.000.
Frommeld, Hans-Dieter, to Hoechst Aktiengesellschaft. Two-component diazotype material. 4,273,850, Cl. 430-173.000.
Frommelt, Horace: *See*—
Cassimally, K. A. I.; and Frommelt, Horace, 4,273,222, Cl. 190-18.00A.
Frommer, Werner: *See*—
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Frosch, Robert A.; Lawing, Pierce L.; and Pagel, LaVerne L. Cooling system for high speed aircraft. 4,273,304, Cl. 244-117.00A.
Fu-Tsai, Lee. Socket joint for torque wrench. 4,272,973, Cl. 64-29.000.
Fuchs, Robert J.: *See*—
Cummins, Richard W.; Fuchs, Robert J.; and Thomas, James L., 4,273,687, Cl. 260-17.200.
Fuji Electric Co., Ltd.: *See*—
Tanaka, Nobuyasu; Nakajima, Kazuhira; Yamaguchi, Kaoru; Hara, Shinji; Murata, Morihiro; Nakazima, Tetuyosi; Matuo, Hirosi; Onishi, Akura; and Hirano, Kazuo, 4,273,253, Cl. 221-75.000.
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Fuji Photo Film Co., Ltd.: *See*—
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Hamaoka, Tsutomu; Morigaki, Masakazu; Sawada, Satoru; Kamio, Takayoshi; and Nakamura, Kotaro, 4,273,864, Cl. 430-551.000.
Hara, Hiroshi; Nakamura, Kotara; and Suzuki, Yoshiaki, 4,273,854, Cl. 430-216.000.
Shiba, Keisuke; Hirose, Takeshi; Hayashi, Jun; Arai, Atsuaki; Furutachi, Nobuo; and Katsuyama, Harumi, 4,273,861, Cl. 430-382.000.
Fujikoshi Machinery Corporation: *See*—
Masuko, Masami; and Ichikawa, Chikanobu, 4,272,924, Cl. 51-165.00R.
Fujishiro, Yuji, to Kabushiki Kaisha Tokyo Kikai Seisakusho. Folding mechanism for a printing press. 4,273,320, Cl. 493-427.000.
Fujita, Hisao; and Kimura, Kiyoshi, to Konishiroku Photo Industry Co., Ltd. Method of detecting toner concentration in electrophotographic copying machine. 4,273,843, Cl. 430-30.000.
Fujita, Isao; Imanishi, Nobuyuki; Tsutaya, Tadao; Watanabe, Ryo; and Kawai, Takao, to Kobe Steel, Limited. Blast-furnace operation method. 4,273,577, Cl. 75-41.000.
Fujita, Yoshio: *See*—
Koyanagi, Rokuo; Fujita, Yoshio; and Mukai, Kunio, 4,273,769, Cl. 424-224.000.
Fujitsu Limited: *See*—
Yoneda, Yasuhiro; Kitakohji, Toshisuke; and Kitamura, Kenro, 4,273,856, Cl. 430-270.000.
Fujiwara, Shunsuke: *See*—
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Fujiyama, Masaaki: *See*—
Akashi, Goro; Yamada, Yasuyuki; Fujiyama, Masaaki; and Yamaguchi, Nobutaka, 4,273,797, Cl. 427-10.000.
Fukasaku, Yoshinori; and Noto, Kunihiro, to Hitachi, Ltd. Rotational speed control circuit for a D.C. motor. 4,274,036, Cl. 318-331.000.
Fukuchi, Shigeki, to Metako Kigyo Co., Ltd. Joint unit. 4,273,462, Cl. 403-171.000.
Fukuhara, Satoru; Todokoro, Hideo; and Sakitani, Yoshio, to Hitachi, Ltd. Field emission electron gun. 4,274,035, Cl. 315-357.000.
Fukumoto, Kiyoshi: *See*—
Yokoyama, Takeo; Fukumoto, Kiyoshi; and Matsuura, Hiroshi, 4,274,108, Cl. 358-31.000.
Fuller, Francis M., to Raymond International Inc. Load supporting structure. 4,273,475, Cl. 405-229.000.
Funderburk, Tim; and McLaughlin, Donald W., to GTE Automatic Electric Laboratories Inc. Multiport conference circuit with multiframe summing and voice level coding. 4,274,155, Cl. 370-62.000.
Furuhashi, Toshio; Abe, Osamu; Hirasawa, Kotaro; and Imai, Masumi, to Hitachi, Ltd. Apparatus for detecting revolutions of an internal combustion engine. 4,274,142, Cl. 364-465.000.
Furuhashi, Toshio: *See*—
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Furutachi, Nobuo: *See*—
Shiba, Keisuke; Hirose, Takeshi; Hayashi, Jun; Arai, Atsuaki; Furutachi, Nobuo; and Katsuyama, Harumi, 4,273,861, Cl. 430-382.000.
Fusari, Mario P., to Illinois Tool Works Inc. Electronic gear checker. 4,272,891, Cl. 33-179.50B.
G-C Dental Industrial Corp.: *See*—
Tomioka, Kentaro; Watanabe, Kazuhiro; and Iwata, Eiji, 4,273,902, Cl. 525-478.000.
G. D. Searle & Co.: *See*—
Mazur, Robert H., 4,273,704, Cl. 260-112.50R.
GA Industries, Inc.: *See*—
Salina, Louis E., 4,273,513, Cl. 417-12.000.
Gaensslen, Fritz H.: *See*—
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GAF Corporation: *See*—
Swietzer, William F., 4,273,820, Cl. 428-159.000.
Gaffar, Abdul; and Gaffar, Maria C., to Colgate-Palmolive Company. Antibacterial oral composition. 4,273,759, Cl. 424-54.000.
Gaffar, Maria C.: *See*—
Gaffar, Abdul; and Gaffar, Maria C., 4,273,759, Cl. 424-54.000.
Gagliani, John, to International Harvester Company. Polyimides. 4,273,886, Cl. 521-185.000.
Gainer, Gordon C.: *See*—
Luck, Russell M.; and Gainer, Gordon C., 4,274,073, Cl. 337-248.000.
Gakken Co., Ltd.: *See*—
Ishiyama, Shozo, 4,273,541, Cl. 434-304.000.
Gal, George; and Pines, Seemon H., to Merck & Co., Inc. Process for preparing methylvanillyl ketone from isoeugenol. 4,273,943, Cl. 568-319.000.
Galantay, Eugene E., to Sandoz, Inc. 1-Alkyl,1-phenyl-butenes. 4,273,787, Cl. 424-331.000.
Galian, Boris A.: *See*—
Paton, Boris E.; Scherbina, Boris E.; Lebedev, Vladimir K.; Ivantsov, Oleg M.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; Galian, Boris A.; Unigovsky, Mikhail R.; and Serafin, Orest M., 4,273,985, Cl. 219-101.000.
Gamalerio, Anna M.: *See*—
Zaffaroni, Pasquale; Vitobello, Vincenza; and Gamalerio, Anna M., 4,273,872, Cl. 435-55.000.
Gannaway, Edwin L., to Tecumseh Products Company. Split crankcase radial automotive compressor. 4,273,519, Cl. 417-273.000.
Gardikes, John J., to Ashland Oil, Inc. Phenolic resin-polyisocyanate binder systems containing dibasic ester solvents. 4,273,179, Cl. 164-43.000.
Garfinkle, Marvin. Wind turbine for marine propulsion. 4,274,011, Cl. 290-55.000.
Garner, John N.; and Hayes, Arthur S., to Northern Telecom Limited. Fluidized powder filling of cable core units. 4,273,597, Cl. 156-48.000.
Garrett Design, Inc.: *See*—
Garrett, Wylie, 4,273,201, Cl. 175-107.000.
Garrett, Wylie, to Garrett Design, Inc. Well drilling collars. 4,273,201, Cl. 175-107.000.
Garscadden, Alan; Bletzinger, Peter; Hasinger, Siegfried H.; Olson, Robert A.; and Sarka, Benjamin, to United States of America, Air Force. Closed cycle annular-return gas flow electrical discharge laser. 4,274,065, Cl. 331-94.50G.
Garten, Robert L.: *See*—
Kugler, Edwin L.; and Garten, Robert L., 4,273,724, Cl. 518-715.000.
Garzia, Aldo; Vittadini, Giorgio; Bottazzi, Andrea; Pelagalli, Domenico; and Coccoli, Costantino, to Istituto Chemioterapico Italiano, S.p.A. Reduction of alkyl esters of carbonic-carboxylic anhydrides to alcohols. 4,273,931, Cl. 546-344.000.

Gaslevic, Emeric: *See—*
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Geary, Joseph M., to United States of America, Air Force. Light-scattering disc collector. 4,273,419, Cl. 350-320.000.

Gebruder Neizsch Maschinenfabrik GmbH & Co.: *See—*
John, Willy, 4,273,647, Cl. 209-250.000.

Gebruder Netzsch, Maschinenfabrik GmbH & Co.: *See—*
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Geller, Douglas A.: *See—*
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General Dynamics Corporation, Electronics Division: *See—*
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General Electric Company: *See—*
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Carnahan, James C., 4,273,717, Cl. 260-345.90R.
Crivello, James V., 4,273,668, Cl. 252-182.000.
Gustafson, Ralph W., 4,274,072, Cl. 337-75.000.
Hoffman, Jacob S.; and Abreu, Mario E., 4,272,955, Cl. 60-39.360.
Howell, Edward K., 4,274,121, Cl. 361-96.000.
Ligon, Woodfin V., Jr.; and Webb, Jimmy L., 4,273,674, Cl. 252-408.000.
MacLaury, Michael R.; and Holub, Fred F., 4,273,691, Cl. 260-23.00S.
Mark, Victor; and Wilson, Phillip S., 4,273,692, Cl. 260-29.10R.
Mark, Victor; and Wilson, Phillip S., 4,273,942, Cl. 568-42.000.
Nuckolls, Joe A., 4,274,033, Cl. 315-209.00R.
Orr, Wallace H., 4,273,408, Cl. 339-198.00G.
Silverstein, Seth D., 4,273,098, Cl. 126-417.000.
Smearing, Robert W., 4,273,689, Cl. 260-22.0CB.
Smetana, Andrew, 4,273,241, Cl. 206-520.000.
Smith, Alfred H., Jr.; De Zuba, George P.; and Mitchell, Tyrone D., 4,273,698, Cl. 260-37.0SB.
Walker, Loren H.; and Cutler, John H., 4,274,042, Cl. 318-803.000.
Williams, Frank J., III, 4,273,712, Cl. 260-326.00N.
Zamek, Otto S., 4,273,917, Cl. 528-288.000.

General Foods Corporation: *See—*
Fariel, Harry F.; Rudolph, Marvin J.; Hynson, Richard B.; Roy, Pradip K.; and Kleiner, Fredric, 4,273,793, Cl. 426-572.000.

General Mills, Inc.: *See—*
Maxcy, Thomas A.; and Denny, John S., 4,273,796, Cl. 426-634.000.

General Motors Corporation: *See—*
Kopich, Leonard F., 4,272,993, Cl. 74-711.000.

General Signal Corporation: *See—*
Fitch, James B., 4,273,515, Cl. 417-62.000.

Gentry, James H., Jr.; and Stiles, Gilbert J., Sr., to Bell Telephone Laboratories, Incorporated. Current meter using core saturation. 4,274,052, Cl. 324-117.00R.

George, Frederick W. Convertible ski boot and binding equipment. 4,273,354, Cl. 280-614.000.

Gerasin, Michael N.: *See—*
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Gerber Products Company: *See—*
Johnson, William P.; and Harter, Elton H., 4,273,792, Cl. 426-482.000.

Gerbracht, Osceola J.: *See—*
Snellman, Donald L.; and Gerbracht, Osceola J., 4,273,326, Cl. 271-288.000.

Gewerkschaft Eisenhutte Westfalia: *See—*
Grisebach, Hans-Theodor, 4,273,383, Cl. 299-23.000.

Ghahramani, Iraj, to International Telephone and Telegraph Corporation. Voltage-to-current converter. 4,274,016, Cl. 307-270.000.

Ghyczy, Jeno; Szoke, Sandor; and Csermely, Gyorgy, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. Aluminum alloys having a high reducing capacity and preparation thereof. 4,273,679, Cl. 252-466.00J.

Gibbs, Dale S.; Benson, Jack H.; and Fernandez, Reet T., to Dow Chemical Company, The. Dispersible vinylidene chloride polymer microgel powders as additives for polymers. 4,273,901, Cl. 525-455.000.

Gibbs, James W., to Gibbs-Ryder Materials Handling Systems, Inc. Material handling apparatus. 4,273,053, Cl. 104-168.000.

Gibbs-Ryder Materials Handling Systems, Inc.: *See—*
Gibbs, James W., 4,273,053, Cl. 104-168.000.

Gibson, Duane M.: *See—*
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Gibson, John P.: *See—*
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Gifford, Maurice J.; Seiferth, Oscar E.; and Grindrod, Paul E., to Oscar Mayer & Co. Inc. Laminated film packages. 4,273,815, Cl. 428-35.000.

Gilbert, Charles H.: *See—*
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Giles, Terence G., to U.S. Philips Corporation. Detection system. 4,274,089, Cl. 340-572.000.

Gillan, John; and Richards, Colin M., to Dulux Australia Limited. Fibrils of cross linked polyester resin having a vesiculated structure. 4,273,830, Cl. 428-398.000.

Gillen, Adelbert M., to Jade Corporation, The. Capacitive force load cell for weighing scale. 4,273,204, Cl. 177-210.00C.

Gillespie, Richard L.; and Geller, Douglas A., to WHAM-0 Mfg. Co. Mirror for producing optical illusions. 4,273,418, Cl. 350-289.000.

Gilson, Alan P.; and Siryj, Bohdan W., to RCA Corporation. Protective cartridge for optical discs. 4,273,342, Cl. 369-32.000.

Gindler, E. Melvin, to Sherwood Medical Industries Inc. Determination of urea. 4,273,556, Cl. 23-230.00B.

Ginther, George E., Sr.; Johnson, A. David, Jr.; and Bachman, Joseph L., to Wayne Automation Corporation. Gate mechanism for carton erecting machine. 4,273,322, Cl. 271-149.000.

Ginzler, Peter. Device for blocking or releasing fluid flow. 4,273,310, Cl. 251-211.000.

Giordano, George P.; Cordrey, Robert E.; and Eberts, Allen F., to CPG Products Corp. Proximity responsive toy. 4,272,916, Cl. 46-253.000.

Girard Equipment, Inc.: *See—*
Brown, J. James, 4,273,153, Cl. 137-454.500.

Girling Limited: *See—*
Farr, Glyn P. R., 4,273,516, Cl. 417-214.000.
Taft, Phillip A., 4,273,358, Cl. 280-708.000.

Glaenzer Spicer: *See—*
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Glass, Cecil A.: *See—*
Aley, Michael H.; Bowen, James A.; and Glass, Cecil A., 4,273,048, Cl. 102-363.000.

Glass, Howard L.; and Elliott, Michael T., to United States of America, Air Force. Method for controlling the resonance frequency of yttrium iron garnet films. 4,273,610, Cl. 156-624.000.

Glassey, Gene; and Gomez, Aldan D., to Fluid Data Systems. Servo-amplifier circuit. 4,274,039, Cl. 318-678.000.

Global Marine, Inc.: *See—*
McNary, James F., 4,273,068, Cl. 114-264.000.

GNS Gesellschaft fur Nuklear-Service mbH: *See—*
Baatz, Henning; and Rittscher, Dieter, 4,274,007, Cl. 250-506.000.

Gobelt, Reiner, to Rowenta-Werke, GmbH. Gas lighter. 4,273,528, Cl. 431-255.000.

Goebel, Herbert, to Siemens Aktiengesellschaft. X-ray powder diffractometer. 4,274,000, Cl. 250-272.000.

Goedde, Franz; Schrank, Wolfgang; and Schulte, Fritz, to Hartung, Kuhn & Co. Maschinenfabrik GmbH. Method and apparatus for quenching heated bulk material. 4,273,617, Cl. 201-39.000.

Golden, Timothy E.: *See—*
Lukas, Sidney; Golden, Timothy E.; Lunarola, Patrick J.; and Mard, Michael G., 4,272,935, Cl. 52-309.110.

Goldstein, Lynn E., to Durafab Division of Texel Industries, Inc. Hazardous environment suit. 4,272,851, Cl. 2-79.000.

Goldstein, Richard. Power supply and control circuit for series connected controller. 4,274,045, Cl. 323-319.000.

Goloff, Alexander, to Caterpillar Tractor Co. Dual fuel rotary controlled pilot and main injection. 4,273,087, Cl. 123-299.000.

Goloff, Alexander, to Caterpillar Tractor Co. Vibrator casting system with feedback. 4,273,178, Cl. 164-4.000.

Gombas, Laszlo A. Method and apparatus for necking-in and flanging a container body. 4,272,977, Cl. 72-121.000.

Gomez, Aldan D.: *See—*
Glassey, Gene; and Gomez, Aldan D., 4,274,039, Cl. 318-678.000.

Gomi, Masae: *See—*
Yamada, Yasushi; Ozawa, Hiroshi; Gomi, Masae; and Nomura, Hideshiro, 4,273,555, Cl. 8-673.000.

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Goodyear Tire & Rubber Company, The: *See—*
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Gordeev, Nikolai A.: *See—*
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Gordon, David R. Blind pressure pilot. 4,273,149, Cl. 137-83.000.

Goren, Yoram: *See—*
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Goto, Minoru: *See—*
Okamoto, Joji; Azuma, Hitoshi; Arai, Katsushi; Naito, Takemi; Kawai, Seiji; and Goto, Minoru, 4,273,811, Cl. 427-232.000.

Goto, Mitsuhiro, to Kabushiki Kaisha Suwa Seikosha. Electronic tone generator. 4,273,019, Cl. 84-1.240.

Gottermeier, William F., to Eastman Kodak Company. Capillary bridge in apparatus for determining ionic activity. 4,273,639, Cl. 204-195.00R.

Gottschalk, Detlef, to Schleicher GmbH & Co. Relais-Werke KG. Self-starting synchronous motor with defined direction of rotation. 4,274,024, Cl. 310-162.000.

Gotz, Edgar: *See—*
Hofer, Gerald; Konrath, Karl; Eheim, Franz; Weiss, Otmar; Schmitt, Edgar; Faupel, Werner; and Gotz, Edgar, 4,273,090, Cl. 123-502.000.

Gould Inc.: *See—*
Thompson, Carl, Jr., 4,274,068, Cl. 335-20.000.

Gould, Walter M. Composite synthetic roofing structure with integral solar collector. 4,273,106, Cl. 126-444.000.

Goumont, Claude: *See—*
Deabriges, Jean; Ferre, Yves; and Goumont, Claude, 4,273,863, Cl. 430-467.000.

Grachten, Erich, to Burris Industries, Inc. Method and apparatus for manufacturing furniture. 4,273,737, Cl. 264-46.500.
Graetz, Clive W., to Imperial Chemical Industries Limited. Macromonomers. 4,273,888, Cl. 525-31.000.
Graham, Richard B., to Dresser Industries, Inc. Plastic chain and tubular link pin. 4,272,952, Cl. 59-84.000.
Grane, Christian; and Kohnke, Ole B., to Hesse, Ruth Lea. Attachment device for tracheal aspirator. 4,273,126, Cl. 128-276.000.
Graves, Louis N., to Louis N. Graves Co., Inc. Sharpening apparatus. 4,272,925, Cl. 51-211.00R.
Greene, Robin N.; and Hertler, Walter R., to Du Pont de Nemours, E. I., and Company. Ethylene-acrylic enamels. 4,273,695, Cl. 260-29.4UA.
Greer Hydraulics, Incorporated: *See*—
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Greiner, Max: *See*—
Stumpp, Gerhard; Greiner, Max; Weiss, Otmar; and Konrath, Karl, 4,273,091, Cl. 123-506.000.
Grey, John C. Torque-transmitting devices. 4,273,227, Cl. 192-56.00R.
Grey, Seymour, to Colgate-Palmolive Company. Article for dispensing liquid bleach softener composition. 4,273,661, Cl. 252-8.800.
Grib, James J.: *See*—
Lin, Wayne H. T.; Grib, James J.; and Mosier, Larry D., 4,273,867, Cl. 435-7.000.
Grier, Nathaniel; Dybas, Richard A.; and Witzel, Bruce E., to Merck & Co., Inc. Treatment of pain, fever, and inflammation with compositions containing piperidinobutan-and 3-buten-2-ones. 4,273,781, Cl. 424-267.000.
Grier, William R.: *See*—
Gubelmann, W. S., deceased; Gubelmann, Walter S., executor; and Grier, William R., 4,273,455, Cl. 400-309.000.
Griffin, Dennis B.; and Fardo, Obie L., to Jay Gee Manufacturing Company. Skinning apparatus. 4,272,862, Cl. 17-21.000.
Griffis, William T. Revolver reloading device. 4,272,903, Cl. 42-89.000.
Grigorov, Sergei S.: *See*—
Pravoverov, Nikolai L.; Nazyrov, Ravil N.; Grigorov, Sergei S.; and Turova, Lidia S., 4,273,137, Cl. 128-784.000.
Grindrod, Paul E.: *See*—
Gifford, Maurice J.; Seiferth, Oscar E.; and Grindrod, Paul E., 4,273,815, Cl. 428-35.000.
Grinnell Fire Protection Systems Company, Inc.: *See*—
Fischer, Michael A.; and Pepi, Jerome S., 4,273,195, Cl. 169-39.000.
Grisebach, Hans-Theodor, to Gewerkschaft Eisenhutte Westfalia. Mineral winning machines. 4,273,383, Cl. 299-23.000.
Grissman Chemicals Limited: *See*—
Diethelm, Eugen, 4,273,783, Cl. 424-273.00R.
Grohe, Klaus; and Lurssen, Klaus, to Bayer Aktiengesellschaft. Agents for regulating plant growth using 2-thiazolone-5-carboxylic acid compounds. 4,273,573, Cl. 71-90.000.
Grossowicz, Nathan: *See*—
Selhub, Jacob; Rachmilewitz, Bracha; and Grossowicz, Nathan, 4,273,757, Cl. 424-1.000.
Groth, Willis G., to H. A. Phillips & Co. Drive mechanism. 4,272,997, Cl. 74-89.220.
Groux, Jean. Ultraviolet endoscope. 4,273,110, Cl. 128-6.000.
Grove, John L., to JLG Industries, Inc. Track mounted aerial lift platform apparatus. 4,273,214, Cl. 182-2.000.
Grunder, Werner; and Loch, Ernst, to Zellweger Uster, Ltd. Device for obtaining a control signal corresponding to the density of the fibre web lying on a fibre-carrying element of a card. 4,272,868, Cl. 19-240.000.
Grundig E.M.V.: *See*—
Mangold, Hans, 4,274,118, Cl. 360-84.000.
GTE Automatic Electric Laboratories Inc.: *See*—
Funderburk, Tim; and McLaughlin, Donald W., 4,274,155, Cl. 370-62.000.
GTE Laboratories Incorporated: *See*—
Blank, Hans G.; and Resnick, Martin L., 4,273,961, Cl. 179-5.00R.
Fahey, Robert J.; and Resnick, Martin L., 4,273,960, Cl. 179-5.00R.
GTE Products Corporation: *See*—
Fahey, Robert J.; and Resnick, Martin L., 4,273,960, Cl. 179-5.00R.
Porsch, Allan W.; and Sorensen, Fred L., 4,273,400, Cl. 339-36.000.
Gubanov, Valentin I.: *See*—
Boriskin, Ivan K.; Bragin, Jury S.; Bykov, Mikhail S.; Gubanov, Valentin I.; Ivanov, Vladlen M.; Tool, Eduard A.; Bazilevich, Sergei V., deceased; Bazilevich, Tatyana N., administrator; Sergeev, Vitaly A., deceased; Sergeeva, Valentina I., administrator; and Sergeeva, Elena V., administrator, 4,273,298, Cl. 241-189.00R.
Gubelmann, W. S., deceased; by Gubelmann, Walter S., executor; and Grier, William R., to Realty and Industrial Corporation. Justifying text writing composing machine. 4,273,455, Cl. 400-309.000.
Gubelmann, Walter S., executor: *See*—
Gubelmann, W. S., deceased; Gubelmann, Walter S., executor; and Grier, William R., 4,273,455, Cl. 400-309.000.
Gudz, Anatoly G.: *See*—
Fomichev, Mikhail M.; Schepakin, Mikhail B.; Gudz, Anatoly G.; Evdokimov, Viktor G.; Lukianov, Nikolai E.; Romanchenko, Irina A.; and Salnikov, Andrei F., 4,273,508, Cl. 415-1.000.
Guiter, Jack L.: *See*—
Dolberg, Dale R.; and Guiter, Jack L., 4,272,948, Cl. 56-246.000.
Gulf Oil Corporation: *See*—
Karim, Khalid A.; and Rea, James H., 4,273,893, Cl. 525-227.000.
Kirkpatrick, Joel L., 4,273,574, Cl. 71-90.000.
Gulf Research & Development Company: *See*—
Vogel, Roger F.; Madgavkar, Ajay M.; and Swift, Harold E., 4,273,188, Cl. 166-256.000.
Gulf & Western Manufacturing Company: *See*—
Carrieri, Louis F., 4,272,980, Cl. 72-404.000.
Gum, Mary L.; and Kearns, Nancye D., to Union Carbide Corporation. Organic amine compositions. 4,273,937, Cl. 564-2.000.
Gundal, Peter H.; and Briggs, Richard, to Packaging Industries, Inc. Indexing drive disconnect. 4,273,230, Cl. 192-150.000.
Gunn, Kenneth M., to Texaco Inc. Manifolded fuel vapor. 4,273,164, Cl. 141-7.000.
Gunter Wulff-Apparatebau GmbH: *See*—
Schone, Siegfried; and Ramlow, Joachim, 4,273,334, Cl. 273-143.00R.
Gurtler, Richard W., to Motorola, Inc. Semiconductor lifetime measurement method. 4,273,421, Cl. 350-353.000.
Gustafson, Ralph W., to General Electric Company. Thermostat and assembly therefor. 4,274,072, Cl. 337-75.000.
Gutierrez, Eddie N.; and Lamberti, Vincent, to Lever Brothers Company. Salts of propene 1,1,2,3-tetracarboxylic acid. 4,273,935, Cl. 562-595.000.
Gutierrez, William A.; and Pollard, John H., to United States of America, Army. Method of preparing a monolithic intrinsic infrared focal plane charge coupled device imager. 4,273,596, Cl. 148-171.000.
Gutjahr, Manfred A.; and Heinrich, Hans, to Daimler-Benz Aktiengesellschaft. Process for the manufacture of sintered metal bodies, in particular battery electrodes. 4,273,582, Cl. 75-222.000.
Guzy, Raymond L., to Centrilift, Inc. Splice for lead-sheathed cable. 4,273,953, Cl. 174-84.00R.
Gyugyi, Laszlo: *See*—
Rosa, John; and Gyugyi, Laszlo, 4,274,135, Cl. 363-68.000.
H. A. Phillips & Co.: *See*—
Groth, Willis G., 4,272,997, Cl. 74-89.220.
Haas, Frank J.: *See*—
Todd, Robert; and Haas, Frank J., 4,274,079, Cl. 340-146.3FT.
Haas, Hans: *See*—
Kotulla, Bernhard; Haas, Hans; Weiser, Martin; Forster, Rolf; Preis, Lothar; and Schmidt, Rudolf, 4,273,476, Cl. 405-258.000.
Haase, Jost-Michael: *See*—
Hiemann, Klaus; and Haase, Jost-Michael, 4,272,990, Cl. 73-586.000.
Habedank, Klaus-Dieter: *See*—
Troebel, Werner; and Habedank, Klaus-Dieter, 4,274,069, Cl. 335-21.000.
Haberthur-Heilig, Walter, to Bron Elektronik AG. Housing for flash apparatus with at least one flash bulb socket. 4,274,126, Cl. 361-334.000.
Hackett, James L. Horseshoe stake support apparatus. 4,273,340, Cl. 273-336.000.
Hadley, Michael S.; and King, Francis D., to Beecham Group, Limited. Pharmaceutically active aza-bicyclo-benzamide derivatives. 4,273,778, Cl. 424-265.000.
Haftmann, Johannes, to Nixdorf Computer AG. Selectively engageable ribbon re-inking device for ink ribbon cartridge. 4,273,453, Cl. 400-196.100.
Hagar, Donald K. Expansion joint and fabric therefor. 4,273,365, Cl. 285-229.000.
Hagemann, Hermann: *See*—
Kuhle, Engelbert; Hagemann, Hermann; Behrenz, Wolfgang; Hammann, Ingeborg; and Stendel, Wilhelm, 4,273,767, Cl. 424-211.000.
Hagerstrom, John R.: *See*—
Lennon, Donald J. J.; Hagerstrom, John R.; and Ekman, C. Frederick W., 4,273,847, Cl. 430-106.000.
Hajek, Miroslav: *See*—
Noland, James S.; and Hajek, Miroslav, 4,273,686, Cl. 260-9.000.
Halcon Research & Development Corp.: *See*—
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Halliburton Company: *See*—
Baker, Eugene E.; Szarka, David D.; Davis, Odie R. S.; and Workman, Nolan M., 4,273,190, Cl. 166-278.000.
Halluin, Albert P.; and Barnett, Allan E., to Exxon Research & Engineering Co. Supported non-ferrous group VIII aluminate coprecipitated hydrogenation catalysts and process for their preparation. 4,273,680, Cl. 252-466.00J.
Halluin, Albert P.: *See*—
Barnett, Allan E.; and Halluin, Albert P., 4,273,939, Cl. 564-358.000.
Hallwirth, Volker: *See*—
Litz, Heinz; Hallwirth, Volker; and Storz, Karl, 4,274,082, Cl. 340-167.00R.
Hamane, Masumi: *See*—
Ishihara, Takeo; Hayashi, Tsutomu; and Hamane, Masumi, 4,273,008, Cl. 74-752.00E.
Hamaoka, Tsutomu; Morigaki, Masakazu; Sawada, Satoru; Kamio, Takayoshi; and Nakamura, Kotaro, to Fuji Photo Film Co., Ltd. Color photographic light-sensitive materials. 4,273,864, Cl. 430-551.000.
Hammann, Ingeborg: *See*—
Kuhle, Engelbert; Hagemann, Hermann; Behrenz, Wolfgang; Hammann, Ingeborg; and Stendel, Wilhelm, 4,273,767, Cl. 424-211.000.
Hammond, Kenneth G.; and Chafetz, Harry, to Texaco Inc. Quaternary ammonium diester salt composition and lubricating oil containing same. 4,273,663, Cl. 252-34.000.

Hanamura, Shoji: *See*—
Ohba, Shinya; Tanaka, Shuhei; Kubo, Masaharu; Ando, Haruhisa; Yamashita, Yataro; Hanamura, Shoji; Aoki, Masakazu; and Nakai, Masaaki, 4,274,113, Cl. 358-212.000.

Hancock, Kevin J., II: *See*—
Aloi, Michael J.; and Hancock, Kevin J., II, 4,273,108, Cl. 126-450.000.

Hannebaum, Harold. Fireplace. 4,273,096, Cl. 126-120.000.

Hannigan, Thomas N., to Portec, Inc. Insulated rail joint. 4,273,284, Cl. 238-160.000.

Hannon, Albert H. Fluid pressure containment actuator. 4,273,031, Cl. 92-88.000.

Hansen, James E.; and Heinz, Jerome G., to Eaton Corporation. Energizing and quick deenergizing circuit for electromagnetic contactors or the like. 4,274,122, Cl. 361-159.000.

Hanson, Bror H. Tower and method of construction. 4,272,929, Cl. 52-40.000.

Hanson, Sheldon H.; Thompson, Craig B.; and Olson, James E., to Heublein, Inc. Taco shell manufacturing process featuring ageing tortillas by tempering for relatively short time in low pressure steam chamber. 4,273,791, Cl. 426-439.000.

Hanson, Spencer R. Rotary dispenser apparatus. 4,273,262, Cl. 222-144.000.

Happe, Ralph A. Method of constructing trumpet or other brass instrument. 4,273,020, Cl. 84-394.000.

Hara, Hiroshi; Nakamura, Kotara; and Suzuki, Yoshiaki, to Fuji Photo Film Co., Ltd. Method for improving the light fastness of organic substrate materials including photographic dye images. 4,273,854, Cl. 430-216.000.

Hara, Katsunori; Baba, Toshihiko; and Okuda, Takio, to Mitsubishi Denki Kabushiki Kaisha. Flash butt welding apparatus. 4,273,984, Cl. 219-97.000.

Hara, Shinji: *See*—
Tanaka, Nobuyasu; Nakajima, Kazuhira; Yamaguchi, Kaoru; Hara, Shinji; Murata, Morihiro; Nakazima, Tetuyosi; Matuo, Hirosi; Onishi, Akura; and Hirano, Kazuo, 4,273,253, Cl. 221-75.000.

Hara, Yasuaki: *See*—
Takamizawa, Minoru; Okada, Fumio; Hara, Yasuaki; and Aoki, Hisashi, 4,273,907, Cl. 528-29.000.

Harada, Tadao; Izumi, Yoshiharu; and Komatsu, Shinichiro, to Kawaken Fine Chemicals Co., Ltd. Modified catalyst for stereo-differentiating reduction of carbonyl compounds and process for reduction with same catalyst. 4,273,933, Cl. 560-179.000.

Harder, Fenton J.: *See*—
Hill, Amos G.; and Harder, Fenton J., 4,273,488, Cl. 414-44.000.

Hardtmann, Goetz E., to Sandoz, Inc. 4-Hydroxy-2-quinolinone-3-carboxylic acid esters. 4,273,930, Cl. 546-90.000.

Hardy, Pierre J. Squeegee device for liquid dispensing bottle. 4,273,459, Cl. 401-139.000.

Harmer, Walter L., to Minnesota Mining and Manufacturing Company. Polyurethane floor varnish and floor materials coated therewith. 4,273,912, Cl. 528-67.000.

Harms, Wolfgang; Jager, Horst; von Oertzen, Klaus; and Wunderlich, Klaus, to Bayer Aktiengesellschaft. Anthraquinone reactive dyestuffs. 4,273,553, Cl. 8-549.000.

Harrington, Edward R., Jr.: *See*—
Marzocchi, Alfred; Roberts, Michael G.; Bolen, Charles E.; and Harrington, Edward R., Jr., 4,273,685, Cl. 260-28.50R.

Harris Corporation: *See*—
Bailey, David C., 4,273,427, Cl. 353-27.00A.
Hillegonds, Clarence G., 4,273,412, Cl. 350-96.200.
Lowry, Robert K.; and Miller, Larry A., 4,272,986, Cl. 73-73.000.
Wolfe, William H., 4,273,962, Cl. 179-7.10R.

Harris, Samuel W.; and Roach, Jack W., to Kerr-McGee Refining Corporation. Process for separating bituminous materials. 4,273,644, Cl. 208-321.000.

Harrison, John L., to Maxwell Laboratories, Inc. AC Resonance transformer. 4,274,046, Cl. 323-355.000.

Hart, Earl D.: *See*—
Bruins, Roger C.; and Hart, Earl D., 4,273,973, Cl. 200-47.000.

Harter, Elton H.: *See*—
Johnson, William P.; and Harter, Elton H., 4,273,792, Cl. 426-482.000.

Hartinger Machalek, Pio. Insulated glass vessel. 4,273,245, Cl. 215-13.00R.

Hartlaub, Jerome T.; Thompson, David L.; and McDonald, Ray S., to Medtronic, Inc. Digital cardiac pacemaker with threshold margin check. 4,273,132, Cl. 128-419.0PT.

Hartlaub, Jerome T.; McDonald, Ray S.; and Rossing, Martin A., to Medtronic, Inc. Programmable digital cardiac pacemaker with means to override effects of reed switch closure. 4,273,133, Cl. 128-419.0PG.

Hartmeister, Ruben J. Parallel action cutting hand tool. 4,272,888, Cl. 30-229.000.

Hartung, Kuhn & Co. Maschinenfabrik GmbH: *See*—
Goedde, Franz; Schrank, Wolfgang; and Schulte, Fritz, 4,273,617, Cl. 201-39.000.

Harvey, William A.: *See*—
Nelson, Gary L.; and Harvey, William A., 4,273,609, Cl. 156-624.000.

Harvill, William A., to Coca-Cola Company, The. Convertible dispenser. 4,272,968, Cl. 62-394.000.

Hase, Alfred M. Inverter circuits. 4,274,137, Cl. 363-139.000.

Hasegawa, Kiyoshi. Root canal measuring apparatus. 4,273,531, Cl. 433-27.000.

Hashimoto, Isao; Taguchi, Toru; and Nambu, Hirohiko, to Mitsui Petrochemical Industries, Ltd. Process for recovery of resorcin. 4,273,623, Cl. 203-92.000.

Hashimoto, Michiaki: *See*—
Nonogaki, Saburo; Morishita, Hajime; Hashimoto, Michiaki; Manabe, Toshikatsu; Tomita, Yoshifumi; and Nishizawa, Masahiro, 4,273,842, Cl. 430-25.000.

Hasinger, Siegfried H.: *See*—
Garscadden, Alan; Bletzinger, Peter; Hasinger, Siegfried H.; Olson, Robert A.; and Sarka, Benjamin, 4,274,065, Cl. 331-94.50G.

Hass, Martin A. Edentulous impression correlator and method of using same. 4,273,532, Cl. 433-37.000.

Hasselbacher, Annemarie: *See*—
Hasselbacher, Wilhelm; and Schalm, Wolfgang, 4,272,941, Cl. 52-731.000.

Hasselbacher, Wilhelm; and Schalm, Wolfgang, to Hasselbacher, Annemarie. Thermally-insulating connecting elements for coupling two component parts, and also compound, thermally-insulating profile members and a process for their manufacture. 4,272,941, Cl. 52-731.000.

Hastings, Donald R., to Nordson Corporation. Nozzle assembly for electrostatic spray guns. 4,273,293, Cl. 239-705.000.

Haug, Ernst: *See*—
Reinhard, Theodor; Haug, Ernst; Hoffmann, Rudiger; and Feichtiger, Dieter, 4,273,027, Cl. 91-32.000.

Haus, Rein, to Wheelock Signals, Inc. Audio-visual signal circuits. 4,274,084, Cl. 340-326.000.

Haviland, John G.: *See*—
Sweeney, Theodore J.; and Haviland, John G., 4,273,827, Cl. 428-307.000.

Haviv, Fortuna; and Carter, George W., to Abbott Laboratories. Bis-(2-benzylaminoethyl)-disulfides. 4,273,940, Cl. 564-372.000.

Hawes, Richard J., to Nacton Works. Reversible ploughs. 4,273,197, Cl. 172-225.000.

Hayakawa, Issei: *See*—
Oda, Isao; Kaneno, Masayuki; and Hayakawa, Issei, 4,273,587, Cl. 106-73.400.

Hayakawa, Shunichi: *See*—
Etsusaki, Yuji; and Hayakawa, Shunichi, 4,273,196, Cl. 172-4.500.

Hayashi, Hidekatsu: *See*—
Takeuchi, Shinziro; Kikuchi, Toshiro; Mitsumoto, Norio; Takahashi, Toyoki; Hayashi, Hidekatsu; and Ichioka, Satoshi, 4,273,954, Cl. 178-19.000.

Hayashi, Jun: *See*—
Shiba, Keisuke; Hirose, Takeshi; Hayashi, Jun; Arai, Atsuaki; Furutachi, Nobuo; and Katsuyama, Harumi, 4,273,861, Cl. 430-382.000.

Hayashi, Tsutomu: *See*—
Ishihara, Takeo; Hayashi, Tsutomu; and Hamane, Masumi, 4,273,008, Cl. 74-752.00E.

Hayashi, Yoshio; Matsui, Takeki; Shiga, Tetsuo; Akashi, Kageyasu; Akiyama, Minoru; and Kimura, Takeo, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for preparing silver salt of organic carboxylic acid. 4,273,723, Cl. 260-414.000.

Hayden, Robert K. Device and method for freeing frozen engine cylinders. 4,273,086, Cl. 123-198.00R.

Haydon, Arthur W.; and Dean, John J., to Tri-Tech, Inc. Electric rotating machine. 4,274,026, Cl. 310-254.000.

Hayes, Arthur S.: *See*—
Garner, John N.; and Hayes, Arthur S., 4,273,597, Cl. 156-48.000.

Hayward, Curtis E.; and Maurer, Friedhelm, to Discovision Associates. Recording disk cover and player apparatus for removing cover. 4,274,119, Cl. 360-97.000.

Heberlein Hispano S.A.: *See*—
Schopper, Alf, 4,272,867, Cl. 19-159.00R.

Hecken, Rudolf P., to Bell Telephone Laboratories, Incorporated. Analyzer for nonlinear networks. 4,274,047, Cl. 324-57.00R.

Hedlund, Rolf E.; and Hynes, Thomas J., to Scanorama, Inc. Resiliently supported electrical floor installation. 4,273,404, Cl. 339-93.00R.

Heilen, Gerd; Nissen, Axel; Koernig, Wolfgang; Horner, Michael; Fliege, Werner; and Boettger, Guenter, to BASF Aktiengesellschaft. Preparation of saturated aliphatic, cycloaliphatic and araliphatic aldehydes. 4,273,945, Cl. 568-420.000.

Heilmann, Steven M.: *See*—
Larimore, Franklin C.; and Heilmann, Steven M., 4,273,135, Cl. 128-640.000.

Heilweil, Israel J.: *See*—
Audeh, Costandi A.; Heilweil, Israel J.; White, James R.; and Yan, Tsoung Y., 4,273,645, Cl. 208-323.000.

Heine, Helmut A.; Rosenbusch, Helmut W.; and Kratzer, Rudolf, to Propper Manufacturing Co., Inc.; and Heine Optotechnik GmbH & Co. KG. Laryngoscope. 4,273,112, Cl. 128-11.000.

Heine Optotechnik GmbH & Co. KG: *See*—
Heine, Helmut A.; Rosenbusch, Helmut W.; and Kratzer, Rudolf, 4,273,112, Cl. 128-11.000.

Heinrich, Hans: *See*—
Gutjahr, Manfred A.; and Heinrich, Hans, 4,273,582, Cl. 75-222.000.

Heinz, Jerome G.: *See*—
Hansen, James E.; and Heinz, Jerome G., 4,274,122, Cl. 361-159.000.

Heitz, Robert G., to Dow Chemical Company, The. Efficient, high power battery module; D.C. transformers and multi-terminal D.C. power networks utilizing same. 4,274,043, Cl. 320-6.000.

Heller, Adam; Leamy, Harry J.; Miller, Barry; Nelson, Ronald J.; and Parkinson, Bruce A., to Bell Telephone Laboratories, Incorporated.

Gallium arsenide devices having reduced surface recombination velocity. 4,273,594, Cl. 148-33.300.
Hendricks, Donald B.; and Knight, Robert M., to MicroComm Corporation. Digital thermostat. 4,274,145, Cl. 364-557.000.
Hennessey, Frank L.: *See—*
Renau, Jacques; Curtis, James W.; Nicholson, Donald S.; and Hennessey, Frank L., 4,274,098, Cl. 343-781.0CA.
Hennessy, Thomas F., to Lori Engineering Corporation. Dead bolt lock. 4,272,974, Cl. 70-129.000.
Hensel, Richard: *See—*
Piesch, Steffen; Dorries, Peter; Schmidt, Ewald; and Hensel, Richard, 4,273,669, Cl. 252-182.000.
Hercules Incorporated: *See—*
Rave, Terence W., 4,273,892, Cl. 525-180.000.
Herdzina, Frank J.; and Vandlik, Robert P., to American Can Company. Transfer mechanism. 4,273,507, Cl. 414-750.000.
Hermanns, Winfried; Lueg, Heinz; Blackert, Hanno; and Wimmenauer, Dirk, to Hermanns, Winfried. Device for determining the moment when competitors in a race are passing the finish line. 4,274,076, Cl. 340-38.00L.
Herrin, Thomas R.: *See—*
Voss, Houston F.; Plattner, Jacob; and Herrin, Thomas R., 4,273,866, Cl. 435-7.000.
Herrmann, Rudolf: *See—*
Sivers, Rolf V.; Herrmann, Rudolf; and Layher, Ulrich, 4,273,207, Cl. 180-70.00P.
Hertler, Walter R.: *See—*
Greene, Robin N.; and Hertler, Walter R., 4,273,695, Cl. 260-29.4UA.
Herzberg, Norman; and Compton, James, Jr., to Herzberg, Norman. Precision reed trimming machine. 4,273,170, Cl. 144-115.000.
Herzfeld, Michael O. H., to Producer Manufacturers Pty. Ltd. Jointing construction. 4,272,939, Cl. 52-527.000.
Hess, Anton; and Bellot, Ramon, to Fritz Buser Maschinenfabrik AG. Device for holding a thin-walled metal cylinder. 4,272,872, Cl. 29-113.00R.
Hesse, Ruth Lea: *See—*
Grane, Christian; and Kohnke, Ole B., 4,273,126, Cl. 128-276.000.
Hesston Corporation: *See—*
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Heublein, Inc.: *See—*
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Hewelt, Robert K.; and Dohring, Edward F., to Hewelt, Robert K. Method and arrangement for eliminating ammonia vapors from developed diazo copy material. 4,273,435, Cl. 354-299.000.
Hewlett Packard Company: *See—*
Luo, Zong S.; and Woodcock, Todd M., 4,273,039, Cl. 101-93.020.
Hexcel Corporation: *See—*
Holland, Kenneth M.; and Custer, Milton F., 4,273,115, Cl. 128-90.000.
Heybourn, Frank: *See—*
Hinchcliffe, Dennis; Bennett, George R.; and Heybourn, Frank, 4,273,233, Cl. 198-347.000.
Heyl, Walter, to Linde Aktiengesellschaft. Control device for an axial piston machine. 4,273,517, Cl. 417-222.000.
Heymer, Gero: *See—*
Lehr, Klaus; Heymer, Gero; Stephan, Hans-Werner; and Thummler, Ursus, 4,273,752, Cl. 423-322.000.
Hice, Jaxon O., to Research Associates, Ltd. Method and apparatus for flash cooking food. 4,273,033, Cl. 99-349.000.
Hickam, William M.: *See—*
Phillips, David C.; Hickam, William M.; and Smith, James D. B., 4,272,988, Cl. 73-339.00R.
Hicks, Kevin B., to United States of America, Agriculture. Ketose sugars from aldose sugars. 4,273,922, Cl. 536-1.000.
Hiemann, Klaus; and Haase, Jost-Michael, to Polygram GmbH. Device for the measurement of acoustic reverberation time and method. 4,272,990, Cl. 73-586.000.
Higuchi, Senji, to Three Bond Co., Ltd. Method for preparing a cylinder liner for liquid-cooled engines having a bandlike sealant on the outer-surface thereof. 4,273,835, Cl. 428-446.000.
Higuchi, Shigeo; Iwasaki, Tsutomu; Sato, Koji; Hirama, Yukio; Watanabe, Masatoshi; Wachi, Yasuyuki; and Yasaka, Yasuhiro, to Hitachi, Ltd. Salient pole rotor with shielding rods between adjacent poles. 4,274,027, Cl. 310-269.000.
Hill, Amos G.; and Harder, Fenton J., to Hesston Corporation. Bale stacking wagon. 4,273,488, Cl. 414-44.000.
Hill, Horace E.: *See—*
Benson, Richard L.; Hill, Horace E.; and Soderberg, Mark S., 4,273,344, Cl. 279-75.000.
Hillegonds, Clarence G., to Harris Corporation. Optical fiber coupling fitting. 4,273,412, Cl. 350-96.200.
Hillstrom, Per A. R.; and Norehall, Lars G., to Mo och Domsjo Aktiebolag. Process and apparatus for continuously washing aqueous fibrous suspensions and controlling the volume of wash liquid. 4,273,612, Cl. 162-49.000.
Hinchcliffe, Dennis; Bennett, George R.; and Heybourn, Frank, to Molins, Limited. Apparatus for conveying rod-like articles. 4,273,233, Cl. 198-347.000.
Hinds, Charles M., to Spar Aerospace Limited. Satellite servicing. 4,273,305, Cl. 244-158.00R.
Hinkle, Ernest G. Gig with removable tines. 4,272,905, Cl. 43-6.000.
Hinton, David O.; and French, Jean G. Battery powered thermal garment with fast and efficent recharging circuit. 4,273,989, Cl. 219-211.000.
Hinton, John R. Drain auger controlling tool. 4,272,860, Cl. 15-257.00R.
Hirama, Yukio: *See—*
Higuchi, Shigeo; Iwasaki, Tsutomu; Sato, Koji; Hirama, Yukio; Watanabe, Masatoshi; Wachi, Yasuyuki; and Yasaka, Yasuhiro, 4,274,027, Cl. 310-269.000.
Hirano, Kazuo: *See—*
Tanaka, Nobuyasu; Nakajima, Kazuhira; Yamaguchi, Kaoru; Hara, Shinji; Murata, Morihiro; Nakazima, Tetuyosi; Matuo, Hirosi; Onishi, Akura; and Hirano, Kazuo, 4,273,253, Cl. 221-75.000.
Hirasawa, Kotaro: *See—*
Furuhashi, Toshio; Abe, Osamu; Hirasawa, Kotaro; and Imai, Masumi, 4,274,142, Cl. 364-465.000.
Hirata, Hitoshi, to Pioneer Electronic Corporation. Quadrature receiver. 4,273,958, Cl. 179-1.0GS.
Hirbod, Farrokh. Oil stimulation process. 4,273,615, Cl. 176-39.000.
Hirose, Takeshi: *See—*
Shiba, Keisuke; Hirose, Takeshi; Hayashi, Jun; Arai, Atsuaki; Furutachi, Nobuo; and Katsuyama, Harumi, 4,273,861, Cl. 430-382.000.
Hirzy, John W., to Monsanto Company. Plastifiers, method of preparation and PVC compositions containing same. 4,273,890, Cl. 525-129.000.
Hitachi Denshi Kabushiki Kaisha: *See—*
Tsutsui, Ken; Sasano, Akira; Nakano, Toshio; Matsumaru, Haruo; and Maruyama, Eiichi, 4,273,812, Cl. 427-248.100.
Hitachi, Ltd.: *See—*
Fukasaku, Yoshinori; and Noto, Kunihiro, 4,274,036, Cl. 318-331.000.
Fukuhara, Satoru; Todokoro, Hideo; and Sakitani, Yoshio, 4,274,035, Cl. 315-357.000.
Furuhashi, Toshio; Abe, Osamu; Hirasawa, Kotaro; and Imai, Masumi, 4,274,142, Cl. 364-465.000.
Higuchi, Shigeo; Iwasaki, Tsutomu; Sato, Koji; Hirama, Yukio; Watanabe, Masatoshi; Wachi, Yasuyuki; and Yasaka, Yasuhiro, 4,274,027, Cl. 310-269.000.
Kamiya, Hiroyuki; Watanabe, Seiji; Taniguchi, Masatosi; Okawara, Tomokichi; Aki, Fumitake; and Wachi, Yasuyuki, 4,274,021, Cl. 310-54.000.
Kanai, Norio, 4,274,004, Cl. 250-442.000.
Kataoka, Keiji; Tatsuno, Kimio; and Saito, Susumu, 4,274,101, Cl. 346-108.000.
Kawamura, Takao, 4,273,683, Cl. 252-513.000.
Kimura, Shoichi; Takahashi, Toshihiko; and Tamura, Zensuke, 4,273,749, Cl. 423-231.000.
Kozima, Yasuyuki, 4,274,114, Cl. 358-257.000.
Kumagai, Yoshio, 4,272,964, Cl. 60-657.000.
Nomura, Nobutaka; Kido, Hiroshi; and Yamada, Kazunari, 4,274,081, Cl. 340-153.000.
Nonogaki, Saburo; Morishita, Hajime; Hashimoto, Michiaki; Manabe, Toshikatsu; Tomita, Yoshifumi; and Nishizawa, Masahiro, 4,273,842, Cl. 430-25.000.
Ohba, Shinya; Tanaka, Shuhei; Kubo, Masaharu; Ando, Haruhisa; Yamashita, Yataro; Hanamura, Shoji; Aoki, Masakazu; and Nakai, Masaaki, 4,274,113, Cl. 358-212.000.
Okamoto, Joji; Azuma, Hitoshi; Arai, Katsushi; Naito, Takemi; Kawai, Seiji; and Goto, Minoru, 4,273,811, Cl. 427-232.000.
Saito, Cyuichi; and Teranishi, Katsuya, 4,273,232, Cl. 198-335.000.
Takahashi, Toshihiko; Maruko, Morihisa; and Kimura, Shoichi, 4,273,748, Cl. 423-230.000.
Tokuda, Hiroatsu; and Furuhashi, Toshio, 4,274,141, Cl. 364-431.000.
Tsutsui, Ken; Sasano, Akira; Nakano, Toshio; Matsumaru, Haruo; and Maruyama, Eiichi, 4,273,812, Cl. 427-248.100.
Watanabe, Takeshi; Sudo, Ryoichi; Shoji, Fusaji; Takemoto, Issei; and Yokono, Hitoshi, 4,273,420, Cl. 350-341.000.
Hitachi Medical Corporation: *See—*
Nagasawa, Yasuo, 4,274,001, Cl. 250-363.00S.
Hitt, Mary M.: *See—*
Tolbert, William R.; Hitt, Mary M.; and Feder, Joseph, 4,273,871, Cl. 435-41.000.
Hizume, Akio: *See—*
Shima, Ichiji; Yamamoto, Tatsuo; Yoshibayashi, Shigeru; Teshima, Hiroshi; Hizume, Akio; Iki, Tetsuo; Yamamoto, Takashi; Kanamori, Kyozo; and Noguchi, Kenzo, 4,272,992, Cl. 73-650.000.
Hlustik, John, to K. Shoemakers Limited. Method of making a moccasin shoe. 4,272,858, Cl. 12-142.0MC.
Hobbs, James R. Compression refrigeration system. 4,272,970, Cl. 62-511.000.
Hodgkinson, Susan D.; and Homan, Peter, to International Business Machines Corporation. Digital telecommunication network having improved data processing systems. 4,274,139, Cl. 364-200.000.
Hodneland, Jan, to Central Pre-Mix Concrete Co. Chute brake for concrete mixing vehicles. 4,273,231, Cl. 193-10.000.
Hoechst Aktiengesellschaft: *See—*
Frommeld, Hans-Dieter, 4,273,850, Cl. 430-173.000.
Kostner, Armin; Lenhart, Richard; and Bittner, Klaus-Jurgen, 4,273,551, Cl. 493-243.000.
Lehr, Klaus; Heymer, Gero; Stephan, Hans-Werner; and Thummler, Ursus, 4,273,752, Cl. 423-322.000.
Mucke, Rainer; Schiller, Johann; and Sackl, Herbert, 4,273,894, Cl. 525-228.000.
Neumann, Jurgen, 4,273,437, Cl. 355-3.0BE.

Nischwitz, Ehrenfried, 4,273,552, Cl. 8-471.000.
Uihlein, Michael, 4,273,653, Cl. 210-198.300.
Hoechst-Roussel Pharmaceuticals, Inc.: *See—*
Allen, Richard C., 4,273,772, Cl. 424-248.540.
Hoefelmayr, Tilman, to Bio-Melktechnik Swiss Hoefelmayr & Co. Milking hose. 4,273,070, Cl. 119-14.510.
Hoehn, Hans, to E. R. Squibb & Sons, Inc. Antibacterial and antifungal derivatives of 3-(1H-imidazol-1-yl)-2-propen-1-ones. 4,273,776, Cl. 424-263.000.
Hofer, Gerald; Konrath, Karl; Eheim, Franz; Weiss, Otmar; Schmitt, Edgar; Faupel, Werner; and Gotz, Edgar, to Robert Bosch GmbH. Fuel injection pump. 4,273,090, Cl. 123-502.000.
Hofer, Gerald; Hubl, Ewald; and Schneider, Steffen, to Robert Bosch GmbH. Hydraulic brake system. 4,273,387, Cl. 303-10.000.
Hoffler, Hans-Otto: *See—*
Birkhofer, Herbert; Diekhoner, Gunther; and Hoffler, Hans-Otto, 4,273,280, Cl. 227-107.000.
Hoffman, Jacob S.; and Abreu, Mario E., to General Electric Company. Diffusing means. 4,272,955, Cl. 60-39.360.
Hoffmann, Arthur K.: *See—*
Zweig, Arnold; and Hoffmann, Arthur K., 4,273,764, Cl. 424-174.000.
Hoffmann-La Roche Inc.: *See—*
Boller, Arthur; Schadt, Martin; and Villiger, Alois, 4,273,929, Cl. 544-242.000.
Suhara, Yasuji; Ogawa, Kiyoshi; Yokose, Kazuteru; and Watanabe, Kimihiro, 4,273,765, Cl. 424-180.000.
Hoffmann, Rudiger: *See—*
Reinhard, Theodor; Haug, Ernst; Hoffmann, Rudiger; and Feichtiger, Dieter, 4,273,027, Cl. 91-32.000.
Hofmann, Eberhard; Ritter, Ernst; and Staudt, Heinrich, to Robert Bosch GmbH. Apparatus for setting the angular relationship between rotating driving, and driven members. 4,273,088, Cl. 123-502.000.
Hofstein, Steven R., to World Medical Marketing Corporation. Foot exerciser. 4,273,113, Cl. 128-25.00B.
Hogan, Frank M. Slingshot. 4,273,094, Cl. 124-20.00R.
Hogan, Patrick M., to Brockway Glass Company, Inc. Glass article strengthened by ion exchange substitution. 4,273,832, Cl. 428-410.000.
Hogg, Walter R., to Coulter Electronics, Inc. Method and apparatus for measurement of reradiation in particle flow cell systems. 4,273,443, Cl. 356-343.000.
Holland, Kenneth M.; and Custer, Milton F., to Hexcel Corporation. Moldable plastic orthopedic cast. 4,273,115, Cl. 128-90.000.
Hollely, David J. E.; and Shepherd, Norris W., to Air Products and Chemicals, Inc. Method and apparatus for cryogenic grinding. 4,273,294, Cl. 241-18.000.
Hollett, Grant T., Jr.; and Flick, Francis S., to Energy and Pollution Controls, Inc. Flue gas desulfurization apparatus and method. 4,273,750, Cl. 423-244.000.
Holly, Harry H. Method for making food patty. 4,272,864, Cl. 17-45.000.
Holmer, Heinz E. A., to AB Volvo. Fuel injection system for diesel engines. 4,273,084, Cl. 123-179.00L.
Holmes, John. Articulator for interconnecting front and rear vehicle chassis portions. 4,273,353, Cl. 280-483.000.
Holstead, Colin: *See—*
Kilminster, Kenneth N.; and Holstead, Colin, 4,273,708, Cl. 260-199.000.
Holtslag, Paulus T. M.: *See—*
Blomsma, Everhard C.; and Holtslag, Paulus T. M., 4,273,470, Cl. 405-202.000.
Holub, Fred F.: *See—*
MacLaury, Michael R.; and Holub, Fred F., 4,273,691, Cl. 260-23.00S.
Homan, Peter: *See—*
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Honda Giken Kogyo Kabushiki Kaisha: *See—*
Ishihara, Takeo; Hayashi, Tsutomu; and Hamane, Masumi, 4,273,008, Cl. 74-752.00E.
Sakata, Mamoru; Kami, Yozo; and Mitsui, Tetsuro, 4,273,356, Cl. 280-675.000.
Honeywell Information Systems Inc.: *See—*
Mones, Arthur H.; Sartell, Jack A.; and Kardashian, Vahram S., 4,273,859, Cl. 430-315.000.
Honma, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Print head for a dot printer. 4,273,452, Cl. 400-124.000.
Hoofnagle, Shirley B. Moisture-relieving garment. 4,272,848, Cl. 2-2.000.
Hoosier, Jack D. Nail holding hammer head. 4,273,172, Cl. 145-30.00R.
Horie, Yu: *See—*
Yokokura, Shuichi; Horie, Yu; Takamizawa, Minoru; Inoue, Yoshio; and Yoshioka, Hiroshi, 4,273,834, Cl. 428-429.000.
Horner, Michael: *See—*
Heilen, Gerd; Nissen, Axel; Koernig, Wolfgang; Horner, Michael; Fliege, Werner; and Boettger, Guenter, 4,273,945, Cl. 568-420.000.
Hornung, Karl-Heinz: *See—*
Feldmann, Rainer; Muller, Karl-Adolf; and Hornung, Karl-Heinz, 4,273,919, Cl. 528-313.000.
Horodysky, Andrew G.: *See—*
Braid, Milton; Horodysky, Andrew G.; and Kaminski, Joan M., 4,273,665, Cl. 252-49.600.
Horrobin, David F., to Efamol Limited. Pharmaceutical and dietary compositions. 4,273,763, Cl. 424-145.000.
Hoshall, Tom C. Material moving apparatus. 4,273,296, Cl. 241-60.000.
Howard, Curtis E.: *See—*
Satter, Abdus; Widmyer, Richard H.; Shum, Yick M.; and Howard, Curtis E., 4,273,187, Cl. 166-250.000.
Howe, Dennis L.: *See—*
Laferty, John M.; Howe, Dennis L.; and Sebenik, Roger F., 4,273,745, Cl. 423-54.000.
Howell, Edward K., to General Electric Company. Target circuit for circuit breaker static trip unit. 4,274,121, Cl. 361-96.000.
HPD Incorporated: *See—*
Cheng, Peter J.; Dockendorff, Jay D.; and Wright, Ernest L., 4,273,670, Cl. 252-301.10W.
Hradel, Joseph R. Simultaneous oil recovery and waste disposal process. 4,273,191, Cl. 166-305.00R.
Huber, Bernhard; and Gonner, Winfried, to Bodenseewerk Perkin-Elmer. Drain apparatus for the reaction vessel in an atomic absorption instrument. 4,273,742, Cl. 422-80.000.
Huber, Lothar, to Luk Lamellen und Kupplungsbau GmbH. Friction clutch. 4,273,228, Cl. 192-89.00B.
Huber, Willi, to J. Wagner AG. Atomizer head for paint spray guns. 4,273,287, Cl. 239-299.000.
Huber, William R., III: *See—*
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Hubl, Ewald: *See—*
Hofer, Gerald; Hubl, Ewald; and Schneider, Steffen, 4,273,387, Cl. 303-10.000.
Hudson Lock, Inc.: *See—*
Patriquin, George P., 4,272,975, Cl. 70-369.000.
Huff-Ste., Inc.: *See—*
Stevens, Garland A., 4,274,129, Cl. 362-109.000.
Huggins, Raymond W.; Burnham, Paul W.; and Torrey, Arthur L., to Xerox Corporation. Development system. 4,273,069, Cl. 118-658.000.
Hughes, Donald W. K., to AMP Incorporated. Electrical connector receptacle. 4,273,402, Cl. 339-91.00R.
Hull Corporation: *See—*
Smith, John A., 4,273,524, Cl. 425-450.100.
Hullenaar, Christina Maria van't, executrix: *See—*
van't Hullenaar, Adrian, deceased, 4,274,148, Cl. 367-122.000.
Hulse, David O., to Budd Company, The. Interlock system for a trailer and bogie. 4,273,347, Cl. 280-80.00B.
Humber, Leslie G.: *See—*
Demerson, Christopher A.; Humber, Leslie G.; and Ferland, Jean-Marie, 4,273,773, Cl. 424-250.000.
Hung, Roland Y.: *See—*
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Hunter Douglas International N.V.: *See—*
Brugman, Johannes Antonius H., 4,272,937, Cl. 52-483.000.
Huss, Otto: *See—*
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Hynes, Thomas J.: *See—*
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Hynson, Richard B.: *See—*
Fariel, Harry F.; Rudolph, Marvin J.; Hynson, Richard B.; Roy, Pradip K.; and Kleiner, Fredric, 4,273,793, Cl. 426-572.000.
Iceland, William F.; and Viri, Donald P., to Rockwell International Corporation. Pulse welding process. 4,273,988, Cl. 219-137.0PS.
Ichikawa, Chikanobu: *See—*
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Ichiko Industries Limited: *See—*
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Ichioka, Satoshi: *See—*
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Ichiyanagi, Toshikazu: *See—*
Iwama, Hideto; Toyama, Masamichi; Shimazaki, Mamoru; and Ichiyanagi, Toshikazu, 4,273,426, Cl. 352-169.000.
Ida, Masatoshi, to Olympus Optical Co., Ltd. Tape recorder. 4,274,116, Cl. 360-65.000.
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Igarashi, Kikuo; and Sugawara, Tamio, to Shionogi & Co., Ltd. Process for preparing aminoglycoside derivatives. 4,273,923, Cl. 536-10.000.
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Tertishnikov, Anatoly S.; Platunov, Boris P.; Novikov, Alexei V.; Gordeev, Nikolai A.; Belebashev, Eduard K.; Lovtsov, Dmitry P.; Korytov, Vladimir A.; and Ignatiev, Jury P., 4,273,180, Cl. 164-49.000.
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Ikegami, Toshimasa, to Kabushiki Kaisha Suwa Seikosha. Setting mechanism of a watch. 4,274,152, Cl. 368-192.000.
Ikenishi, Masataka; Miyazaki, Joichi; Kushida, Shozo; Nakanishi, Hiromasa; Ueda, Makoto; and Shida, Masaharu, to Kabushiki Kaisha Daini Seikosha. Electronic watch. 4,274,150, Cl. 368-185.000.
Iki, Tetsuo: *See—*
Shima, Ichiji; Yamamoto, Tatsuo; Yoshibayashi, Shigeru; Teshima, Hiroshi; Hizume, Akio; Iki, Tetsuo; Yamamoto, Takashi; Kanamori, Kyozo; and Noguchi, Kenzo, 4,272,992, Cl. 73-650.000.
Illinois Tool Works Inc.: *See—*
Fusari, Mario P., 4,272,891, Cl. 33-179.50B.

Imai, Masumi: *See—*
Furuhashi, Toshio; Abe, Osamu; Hirasawa, Kotaro; and Imai, Masumi, 4,274,142, Cl. 364-465.000.
Imanishi, Nobuyuki: *See—*
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Imperial Chemical Industries Limited: *See—*
Graetz, Clive W., 4,273,888, Cl. 525-31.000.
Lane, Ruth M.; and Stacey, Martyn H., 4,273,678, Cl. 252-463.000.
Marshall, Dennis; and Murfitt, Harry C., 4,273,696, Cl. 260-31.40R.
Nerurkar, Mohanlal S.; and Knowles, Peter G., 4,274,025, Cl. 310-215.000.
Rose, John B., 4,273,903, Cl. 525-534.000.
Shaw, Frederick W.; and Whale, William E., 4,273,823, Cl. 428-224.000.
Stratton, Andrew, 4,273,051, Cl. 102-202.200.
Thomson, Robert P.; and Robertson, James R., 4,273,506, Cl. 414-735.000.
Inagaki, Sanji; Nagai, Koji; and Kameda, Hiromi, to Minolta Camera Kabushiki Kaisha. Oriented magnetic toner. 4,273,848, Cl. 430-107.000.
Incoe Corporation: *See—*
Reitan, David M., 4,273,525, Cl. 425-549.000.
Industrial Designs & Services: *See—*
Crane, Walton B., 4,273,548, Cl. 493-162.000.
Injection Plastics & Manufacturing Co.: *See—*
Strang, Robert E., Sr., 4,273,618, Cl. 202-158.000.
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Inoue-Japax Research Incorporated: *See—*
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Inoue, Kiyoshi; and Kaneko, Hideo, 4,273,595, Cl. 148-103.000.
Inoue, Jun: *See—*
Tanaka, Shunroku; Inoue, Jun; Yukimachi, Katsurou; and Minamino, Keiichi, 4,273,184, Cl. 165-59.000.
Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Sintering method. 4,273,581, Cl. 75-214.000.
Inoue, Kiyoshi; and Kaneko, Hideo, to Inoue-Japax Research Incorporated. Method of preparing thermomagnetically treated magnetically anisotropic objects. 4,273,595, Cl. 148-103.000.
Inoue, Tsutomu, to Takara Co., Ltd. Multi-position remote controlling device for toys. 4,272,918, Cl. 46-266.000.
Inoue, Yoshio: *See—*
Yokokura, Shuichi; Horie, Yu; Takamizawa, Minoru; Inoue, Yoshio; and Yoshioka, Hiroshi, 4,273,834, Cl. 428-429.000.
Institut Textile de France: *See—*
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Rut, Tadeusz, 4,272,979, Cl. 72-356.000.
Intel Corporation: *See—*
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Interlake, Inc.: *See—*
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Bisczat, John J.; Lisk, Robert R.; McCray, William R.; and Sizemore, James L., 4,273,456, Cl. 400-550.000.
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Carter, Eric L.; and Nosowicz, Eugene J., 4,274,017, Cl. 307-289.000.
Crowder, Billy L.; Gaensslen, Fritz H.; and Jaeger, Richard C., 4,274,105, Cl. 357-23.000.
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Fang, Frank F.; and Hung, Roland Y., 4,274,104, Cl. 357-19.000.
Faris, Sadeg M., 4,274,015, Cl. 307-264.000.
Feinberg, Irving; and Wu, Leon L., 4,274,124, Cl. 361-275.000.
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Markham, Harvey R.; and Shepherd, Roger D., 4,273,439, Cl. 355-14.00C.
Sebrosky, Robert A.; and Thorne, William D., 4,273,040, Cl. 101-93.040.
International Flavors & Fragrances Inc.: *See—*
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,273,662, Cl. 252-8.900.
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International Minerals & Chemical Corp.: *See—*
Edwards, Donald W.; Young, Paul R.; and Zukovich, Thomas M., 4,273,049, Cl. 102-312.000.
International Telephone and Telegraph Corporation: *See—*
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van de Wetering, Martinus B., 4,273,373, Cl. 294-101.000.
Interprovincial Steel and Pipe Corporation, Ltd.: *See—*
Bell, David A., 4,272,984, Cl. 73-40.50R.
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Swearingen, Judson S.; and Irvine, Michael D., 4,273,390, Cl. 308-168.000.
Ishida, Kohji; and Numata, Tatsuo, to Pioneer Electronic Corporation. MPX Stereophonic demodulation. 4,274,057, Cl. 329-167.000.
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Ishigaki, Isao: *See—*
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Ishihara, Takeo; Hayashi, Tsutomu; and Hamane, Masumi, to Honda Giken Kogyo Kabushiki Kaisha. Automatic transmission. 4,273,008, Cl. 74-752.00E.
Ishihara, Toshinobu: *See—*
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Ishii, Ryougi: *See—*
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Ishiyama, Shozo, to Gakken Co., Ltd. Clock for educational purposes. 4,273,541, Cl. 434-304.000.
Isobe, Takayuki; and Matsuzaki, Mikio, to Nissan Motor Company, Limited; and Ichiko Industries Limited. Mirror assembly with indicator. 4,274,078, Cl. 340-98.000.
Istituto Chemioterapico Italiano, S.p.A.: *See—*
Garzia, Aldo; Vittadini, Giorgio; Bottazzi, Andrea; Pelagalli, Domenico; and Coccoli, Costantino, 4,273,931, Cl. 546-344.000.
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Ito, Hiroshi, to Tokico Ltd. Friction pad of disc brake. 4,273,219, Cl. 188-256.000.
Ito, Michinobu: *See—*
Shirai, Makoto; Ito, Michinobu; and Kato, Osamu, 4,273,480, Cl. 407-114.000.
Ito, Susumu; and Toki, Kaoru, to Nippon Electric Co., Ltd. Magnetic rotary encoder for detection of absolute values of angular displacement. 4,274,053, Cl. 324-174.000.
Ivanov, Vladlen M.: *See—*
Boriskin, Ivan K.; Bragin, Jury S.; Bykov, Mikhail S.; Gubanov, Valentin I.; Ivanov, Vladlen M.; Tool, Eduard A.; Bazilevich, Sergei V., deceased; Bazilevich, Tatyana N., administrator; Sergeev, Vitaly A., deceased; Sergeeva, Valentina I., administrator; and Sergeeva, Elena V., administrator, 4,273,298, Cl. 241-189.00R.
Ivantsov, Oleg M.: *See—*
Paton, Boris E.; Scherbina, Boris E.; Lebedev, Vladimir K.; Ivantsov, Oleg M.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; Galian, Boris A.; Unigovsky, Mikhail R.; and Serafin, Orest M., 4,273,985, Cl. 219-101.000.
Iwahana, Takehiko: *See—*
Yamashita, Hiroshi; Iwahana, Takehiko; and Fujiwara, Shunsuke, 4,273,054, Cl. 104-281.000.
Iwai, Yoshio: *See—*
Takeuchi, Keizo; Iwai, Yoshio; Yamanaka, Tadashi; and Miura, Tatsuo, 4,272,877, Cl. 29-403.200.
Iwama, Hideto; Toyama, Masamichi; Shimazaki, Mamoru; and Ichiyanagi, Toshikazu, to Canon Kabushiki Kaisha. Motion picture system. 4,273,426, Cl. 352-169.000.
Iwanaga, Kazuyoshi; Sugano, Kazuhiko; and Ohtsuka, Kunio, to Nissan Motor Company Limited. Transmission throttle valve for use in hydraulic control system of automatic power transmission. 4,273,009, Cl. 74-869.000.
Iwasaki, Tsutomu: *See—*
Higuchi, Shigeo; Iwasaki, Tsutomu; Sato, Koji; Hirama, Yukio; Watanabe, Masatoshi; Wachi, Yasuyuki; and Yasaka, Yasuhiro, 4,274,027, Cl. 310-269.000.
Iwata, Eiji: *See—*
Tomioka, Kentaro; Watanabe, Kazuhiro; and Iwata, Eiji, 4,273,902, Cl. 525-478.000.
Izumi, Yoshiharu: *See—*
Harada, Tadao; Izumi, Yoshiharu; and Komatsu, Shinichiro, 4,273,933, Cl. 560-179.000.
J. I. Case Company: *See—*
Baenen, Paul W., 4,273,169, Cl. 144-34.00R.
Maurer, Herman J.; and Smith, Wayne G., 4,273,502, Cl. 414-694.000.
J. M. Ney Company, The: *See—*
Winer, Irving G., 4,273,181, Cl. 164-114.000.
J. M. Voith GmbH: *See—*
Dietrich, Robert, 4,272,873, Cl. 29-123.000.
J. T. Posey Company: *See—*
Larkey, Orval W., 4,273,336, Cl. 273-189.00R.
J. Wagner AG: *See—*
Huber, Willi, 4,273,287, Cl. 239-299.000.
Jackson, Edward L. Method and apparatus for custom closing or modifying building openings. 4,272,942, Cl. 52-741.000.
Jackson, Jay W.: *See—*
Thomerson, Clarence; and Jackson, Jay W., 4,273,473, Cl. 405-212.000.
Jacobs, Stanley C.: *See—*
Dawless, Robert K.; and Jacobs, Stanley C., 4,273,627, Cl. 204-67.000.
Jacquemart, Jean: *See—*
Beraud, Claudius; and Jacquemart, Jean, 4,273,635, Cl. 204-165.000.
Jacques, Roland; and Poisson, Regis, to Rhone-Poulenc Industries. Production of spheroidal alumina shaped articles. 4,273,735, Cl. 264-5.000.

Jade Corporation, The: *See—*
Gillen, Adelbert M., 4,273,204, Cl. 177-210.00C.

Jaeger, Richard C.: *See—*
Crowder, Billy L.; Gaensslen, Fritz H.; and Jaeger, Richard C., 4,274,105, Cl. 357-23.000.

Jaeken, Jan; Verhecken, Andre; Vetter, Hans; and Marx, Paul, to AGFA-GEVAERT N.V. Photographic diffusion transfer process and material for the production of color images and suitable compounds therefor. 4,273,855, Cl. 430-242.000.

Jag International Sales Limited: *See—*
Wolfe, Maynard F., 4,273,956, Cl. 179-1.00H.

Jagenberg Werke Aktiengesellschaft: *See—*
Philipp, Helmut, 4,273,324, Cl. 271-183.000.

Jager, Horst: *See—*
Harms, Wolfgang; Jager, Horst; von Oertzen, Klaus; and Wunderlich, Klaus, 4,273,553, Cl. 8-549.000.

Jahnsen, Egil J.: *See—*
Corrigan, James H.; and Jahnsen, Egil J., 4,273,576, Cl. 75-11.000.

James, Ian R., to Lovejoy, Inc. Universal joint. 4,272,972, Cl. 64-17.0SP.

James, Raymond E., to Palletron Incorporated. Stacking apparatus. 4,273,490, Cl. 414-95.000.

Jan Van Tilburg. Smoke filters. 4,273,141, Cl. 131-336.000.

Janik, Leon P., Jr. Air starter. 4,273,085, Cl. 123-179.00F.

Japan Atomic Energy Research Institute: *See—*
Machi, Sueo; Ishigaki, Isao; Sugo, Takanobu; Murata, Kazuo; Tanso, Shiro; and Senoo, Keizi, 4,273,840, Cl. 429-144.000.

Japanese National Railways: *See—*
Yamashita, Hiroshi; Iwahana, Takehiko; and Fujiwara, Shunsuke, 4,273,054, Cl. 104-281.000.

Jassawalla, Jal S., to Andros Incorporated. Medical infusion system. 4,273,121, Cl. 128-214.00F.

Javan, Ali. Infrared spectroscopic lamps and gas detectors incorporating such lamps. 4,274,063, Cl. 331-94.50R.

Jay Gee Manufacturing Company: *See—*
Griffin, Dennis B.; and Fardo, Obie L., 4,272,862, Cl. 17-21.000.

Jefferis, Mark: *See—*
Meyer, Paul M.; Beckwith, Robert H.; Allman, Richard D.; and Jefferis, Mark, 4,274,144, Cl. 364-551.000.

Jensen, Lyle B.; and Wittman, Leroy L., to FMC Corporation. Crane upperstructure self-transferring system. 4,273,244, Cl. 212-181.000.

Jensen, Werner K.: *See—*
Osther, Kurt B.; and Jensen, Werner K., 4,273,703, Cl. 260-112.00R.

Jet Research Center, Inc.: *See—*
Brown, Claude H., 4,273,050, Cl. 102-321.000.
Rommer, T. James, 4,273,047, Cl. 102-310.000.

Jette, Emile. Showerhead spray texture control. 4,273,289, Cl. 239-458.000.

JLG Industries, Inc.: *See—*
Grove, John L., 4,273,214, Cl. 182-2.000.

Johannessen, Paul R., to Megapulse Incorporated. Method of and apparatus for high voltage pulse generation. 4,274,134, Cl. 363-59.000.

John D. Hollingsworth on Wheels, Inc.: *See—*
Schmolke, Karl H., 4,272,865, Cl. 19-97.000.

John Fluke Mfg. Co., Inc.: *See—*
Brodie, Benjamin T.; and Koeman, Henriecus, 4,274,143, Cl. 364-483.000.

John Lysaght (Australia) Limited: *See—*
Reid, Paul, 4,273,800, Cl. 427-47.000.

John, Willy, to Gebruder Neizsch Maschinenfabrik GmbH & Co. Apparatus for and a method of separating grinding bodies and ground material in an agitator mill. 4,273,647, Cl. 209-250.000.

Johnk, Kurt, to Draloric Electronic GmbH. Process for covering or coating electrical components. 4,273,803, Cl. 427-58.000.

Johnson, A. David, Jr.: *See—*
Ginther, George E., Sr.; Johnson, A. David, Jr.; and Bachman, Joseph L., 4,273,322, Cl. 271-149.000.

Johnson, Donald R. Dome head punch. 4,273,015, Cl. 83-670.000.

Johnson, Neal W., to Phillips Petroleum Company. Cooling tower operation with automated pH control and blowdown. 4,273,146, Cl. 137-5.000.

Johnson, Paulette: *See—*
Martin, Jerry R.; Tadanier, John S.; and Johnson, Paulette, 4,273,925, Cl. 536-17.00R.

Johnson, Raynor A.: *See—*
Wegener, Jack; and Johnson, Raynor A., 4,272,856, Cl. 5-81.00R.

Johnson, William P.; and Harter, Elton H., to Gerber Products Company. Banana processing. 4,273,792, Cl. 426-482.000.

Johnston, James D.: *See—*
Clark, Keith H.; and Johnston, James D., 4,273,505, Cl. 414-735.000.

Johnston, Orin B. Heat bonding device. 4,273,604, Cl. 156-382.000.

Jones, Richard E.; and Smithers, Jacquelyn A., to Syntex Corporation. Process for preparing flunisolide. 4,273,710, Cl. 260-239.55D.

Jones, Robert J., to TRW Inc. Curable cycloaliphatic epoxy-polyimide compositions. 4,273,916, Cl. 528-117.000.

Jordan, Heinz, to Technische Gerate -u. Entwicklungsgesellschaft m.b.H. Aircraft with counterrotating members. 4,273,302, Cl. 244-23.00C.

Jorgensen, Robert, to Kawneer Company, Inc. Traffic responsive control system for automatically operated doors. 4,272,921, Cl. 49-30.000.

Jorgenson, Lyle A. Combination push and tow bar. 4,273,352, Cl. 280-481.000.

Jos. Schneider & Co., Optische Werke: *See—*
Sonnet, Gunther, 4,273,415, Cl. 350-465.000.

Judge, John F. X., to Technicon Instruments Corporation. Keyboard-display combination. 4,274,093, Cl. 340-712.000.

Juranas, David L., to Mallinckrodt, Inc. Limulus lysate procedure for determining endotoxins. 4,273,557, Cl. 23-230.00B.

K. Shoemakers Limited: *See—*
Hlustik, John, 4,272,858, Cl. 12-142.0MC.

Kabushiki Kaisha Daini Seikosha: *See—*
Ikenishi, Masataka; Miyazaki, Joichi; Kushida, Shozo; Nakanishi, Hiromasa; Ueda, Makoto; and Shida, Masaharu, 4,274,150, Cl. 368-185.000.

Kabushiki Kaisha Komatsu Seisakusho: *See—*
Etsusaki, Yuji; and Hayakawa, Shunichi, 4,273,196, Cl. 172-4.500.

Kabushiki Kaisha Morita Seisakusho: *See—*
Yamamoto, Hajime; and Yoshikawa, Shogo, 4,273,535, Cl. 433-216.000.

Kabushiki Kaisha Sato Kenkyusho: *See—*
Sato, Yo, 4,273,046, Cl. 101-348.000.

Kabushiki Kaisha Suwa Seikosha: *See—*
Goto, Mitsuhiro, 4,273,019, Cl. 84-1.240.
Ikegami, Toshimasa, 4,274,152, Cl. 368-192.000.
Kamiwaki, Osamu, 4,274,151, Cl. 368-21.000.

Kabushiki Kaisha Tokyo Kikai Seisakusho: *See—*
Fujishiro, Yuji, 4,273,320, Cl. 493-427.000.

Kai Cutlery Center Co., Ltd.: *See—*
Asano, Tamoru, 4,272,886, Cl. 30-47.000.

Kajita, Tosifumi, to Marubeni Kogyo K.K. Wheelchair lift. 4,273,217, Cl. 187-9.00R.

Kakugo, Masahiro: *See—*
Asada, Mamoru; Shiga, Akinobu; Matsuyama, Kiyoshi; and Kakugo, Masahiro, 4,273,905, Cl. 526-142.000.

Kalicki, John H.: *See—*
Laurie, Alec H.; and Kalicki, John H., 4,273,731, Cl. 261-77.000.

Kals, Walter, to Niagara Blower Company. Apparatus for cooling fluids. 4,273,733, Cl. 261-151.000.

Kamada, Kazumasa; Kushi, Kenji; Yoshihara, Keisuke; and Nakamoto, Hideo, to Mitsubishi Rayon Co., Ltd. Method for producing a synthetic resin molded product having an abrasion resistant surface. 4,273,799, Cl. 427-44.000.

Kamada, Kazumasa; Kushi, Kenji; Yoshihara, Keisuke; and Nakamoto, Hideo, to Mitsubishi Rayon Co., Ltd. Coating composition and a method for producing a synthetic resin molded product having an abrasion resistant surface. 4,273,802, Cl. 427-54.100.

Kamal, Nabil. X-Y Alternating drive profiling system. 4,273,059, Cl. 112-121.140.

Kameda, Hiromi: *See—*
Inagaki, Sanji; Nagai, Koji; and Kameda, Hiromi, 4,273,848, Cl. 430-107.000.

Kamholz, Kenneth: *See—*
Levenspiel, Octave; and Kamholz, Kenneth, 4,272,893, Cl. 34-1.000.

Kami, Yozo: *See—*
Sakata, Mamoru; Kami, Yozo; and Mitsui, Tetsuro, 4,273,356, Cl. 280-675.000.

Kaminski, Joan M.: *See—*
Braid, Milton; Horodysky, Andrew G.; and Kaminski, Joan M., 4,273,665, Cl. 252-49.600.

Kamio, Takayoshi: *See—*
Hamaoka, Tsutomu; Morigaki, Masakazu; Sawada, Satoru; Kamio, Takayoshi; and Nakamura, Kotaro, 4,273,864, Cl. 430-551.000.

Kamiwaki, Osamu, to Kabushiki Kaisha Suwa Seikosha. Electronic watch having an alarm function and a global time display function. 4,274,151, Cl. 368-21.000.

Kamiya, Hiroyuki; Watanabe, Seiji; Taniguchi, Masatosi; Okawara, Tomokichi; Aki, Fumitake; and Wachi, Yasuyuki, to Hitachi, Ltd. Liquid cooled stator winding for a rotary electric machine having reduced thermal elongation stresses. 4,274,021, Cl. 310-54.000.

Kamp, Ewald A., to Union Carbide Corporation. Method for producing a flat bottom plastic bag. 4,273,550, Cl. 493-240.000.

Kamphorst, Walter: *See—*
Lukes, Henry J.; Kamphorst, Walter; and Asmar, Romeal F., 4,274,056, Cl. 328-162.000.

Kanai, Norio, to Hitachi, Ltd. Ion implanter. 4,274,004, Cl. 250-442.000.

Kanamaru, Hitoshi, to Universal Pioneer Corporation. Servo unit for optical type information reading device. 4,273,998, Cl. 250-204.000.

Kanamori, Katsuhiko, to Yokohama Rubber Co., Ltd., The. Pressure-sensitive electrically conductive elastomeric composition. 4,273,682, Cl. 252-511.000.

Kanamori, Kyozo: *See—*
Shima, Ichiji; Yamamoto, Tatsuo; Yoshibayashi, Shigeru; Teshima, Hiroshi; Hizume, Akio; Iki, Tetsuo; Yamamoto, Takashi; Kanamori, Kyozo; and Noguchi, Kenzo, 4,272,992, Cl. 73-650.000.

Kanazawa, Tadashi: *See—*
Kawamura, Masao; Nishi, Tadaaki; Kato, Kunioki; Mizokami, Hiroshi; and Kanazawa, Tadashi, 4,273,941, Cl. 564-416.000.

Kaneko, Hideo: *See—*
Inoue, Kiyoshi; and Kaneko, Hideo, 4,273,595, Cl. 148-103.000.

Kaneko, Takashi: *See—*
Saiki, Noritsugu; and Kaneko, Takashi, 4,273,899, Cl. 525-439.000.

Kaneko, Tamaki; Mizuma, Kenich; and Okuzawa, Tugio, to Ricoh Co., Ltd. Sheet feeding apparatus for copying machine, printing machine, etc. 4,273,323, Cl. 271-157.000.

Kaneno, Masayuki: *See*—
Oda, Isao; Kaneno, Masayuki; and Hayakawa, Issei, 4,273,587, Cl. 106-73.400.
Kao Soap Co., Ltd.: *See*—
Sakurai, Akira, 4,273,125, Cl. 128-263.000.
Kar Fabricators, Inc.: *See*—
Trahan, Karl W., Sr.; and Smith, Timothy S., 4,273,466, Cl. 404-4.000.
Kardashian, Vahram S.: *See*—
Mones, Arthur H.; Sartell, Jack A.; and Kardashian, Vahram S., 4,273,859, Cl. 430-315.000.
Karim, Khalid A.; and Rea, James H., to Gulf Oil Corporation. Ternary blends of low density ethylene polymers, ethylene-alkyl acrylate copolymers and amorphous isobutylene polymers. 4,273,893, Cl. 525-227.000.
Karman, James S., to Exxon Production Research Company. Thickener control process. 4,273,658, Cl. 210-709.000.
Kataoka, Keiji; Tatsuno, Kimio; and Saito, Susumu, to Hitachi, Ltd. Laser recorder with piezoelectric bimorph focal length vibrator. 4,274,101, Cl. 346-108.000.
Katayama, Morimitsu: *See*—
Miyahara, Masayoshi; Katayama, Morimitsu; and Kisaka, Hiroyuki, 4,273,001, Cl. 74-359.000.
Kato, Kunioki: *See*—
Kawamura, Masao; Nishi, Tadaaki; Kato, Kunioki; Mizokami, Hiroshi; and Kanazawa, Tadashi, 4,273,941, Cl. 564-416.000.
Kato, Osamu: *See*—
Shirai, Makoto; Ito, Michinobu; and Kato, Osamu, 4,273,480, Cl. 407-114.000.
Kato, Tadaaki, to Kureha Kagaku Kogyo Kabushiki Kaisha. Method for preparing collagen filaments for use in medical treatments. 4,273,705, Cl. 260-123.700.
Katsuyama, Harumi: *See*—
Shiba, Keisuke; Hirose, Takeshi; Hayashi, Jun; Arai, Atsuaki; Furutachi, Nobuo; and Katsuyama, Harumi, 4,273,861, Cl. 430-382.000.
Katzin, Leonard. Zero insertion force electrical connector. 4,273,401, Cl. 339-47.00R.
Kawai Musical Instrument Mfg. Co., Ltd.: *See*—
Deutsch, Ralph, 4,273,018, Cl. 84-1.220.
Kawai, Seiji: *See*—
Okamoto, Joji; Azuma, Hitoshi; Arai, Katsushi; Naito, Takemi; Kawai, Seiji; and Goto, Minoru, 4,273,811, Cl. 427-232.000.
Kawai, Takao: *See*—
Fujita, Isao; Imanishi, Nobuyuki; Tsutaya, Tadao; Watanabe, Ryo; and Kawai, Takao, 4,273,577, Cl. 75-41.000.
Kawaken Fine Chemicals Co., Ltd.: *See*—
Harada, Tadao; Izumi, Yoshiharu; and Komatsu, Shinichiro, 4,273,933, Cl. 560-179.000.
Nagashima, Tetsuya; Usuba, Yasunori; Ogawa, Takahisa; and Takehara, Masahiro, 4,273,684, Cl. 252-544.000.
Kawamura, Masao; Nishi, Tadaaki; Kato, Kunioki; Mizokami, Hiroshi; and Kanazawa, Tadashi, to Seitetsu Kagaku Co., Ltd. Process for producing p-hydroxybenzaldehyde. 4,273,941, Cl. 564-416.000.
Kawamura, Takao, to Hitachi, Ltd. Oxide cathode and process for production thereof. 4,273,683, Cl. 252-513.000.
Kawanabe, Yoshihiro, to Pioneer Electronic Corporation. Signal change-over amplifier. 4,274,060, Cl. 330-295.000.
Kawneer Company, Inc.: *See*—
Jorgensen, Robert, 4,272,921, Cl. 49-30.000.
Kazumi, Nakahara, to NGK Spark Plug Co., Ltd. Piezoelectric ignition device. 4,273,529, Cl. 431-255.000.
Kearns, Nancye D.: *See*—
Gun., Mary L.; and Kearns, Nancye D., 4,273,937, Cl. 564-2.000.
Keeney, Gary E.; Zurcher, Allen K.; and Loomis, Ervin C., to Plasta-Plug, Inc. Pipe coupling. 4,273,367, Cl. 285-419.000.
Kelly, Timm L., to Amchem Products, Inc. Coating solution for metal surfaces. 4,273,592, Cl. 148-6.270.
Kempe, Uwe: *See*—
Merger, Franz; Nestler, Gerhard; and Kempe, Uwe, 4,273,938, Cl. 564-124.000.
Kemtec, Inc.: *See*—
Singelyn, James D., 4,273,831, Cl. 428-402.000.
Kent, Peter J. C.; and Page, John K. R., to Calor Group Limited, The. Thermal energy storage material comprising hydrated compound and water-swollen cross-linked polymer. 4,273,667, Cl. 252-70.000.
Keran, Vitie P.; and Baker, Alan C., to Direct Reduction Corporation, The. Direct reduction rotary kiln with improved air injection. 4,273,314, Cl. 266-145.000.
Kerlin, Allen L. Method of forming a sheet of single crystal semiconductor material. 4,273,608, Cl. 156-605.000.
Kern & Co. A.G.: *See*—
Canzek, Ludvik, 4,273,425, Cl. 350-444.000.
Kern, Werner: *See*—
Tracy, Chester E.; and Kern, Werner, 4,273,828, Cl. 428-336.000.
Kerr-McGee Coal Corporation: *See*—
Tompkins, John C., 4,273,193, Cl. 166-314.000.
Kerr-McGee Refining Corporation: *See*—
Harris, Samuel W.; and Roach, Jack W., 4,273,644, Cl. 208-321.000.
Khemlani, Moti T.: *See*—
Viscovich, Paul W.; and Khemlani, Moti T., 4,272,962, Cl. 60-648.000.
Kho, Khe-Bing J., to Reichhold Chemicals, Incorporated. Polyol resin binder compositions and process. 4,273,700, Cl. 260-38.000.
Kido, Hiroshi: *See*—
Nomura, Nobutaka; Kido, Hiroshi; and Yamada, Kazunari, 4,274,081, Cl. 340-153.000.
Kidon, William E.; Shuster, Nicholas; and Babinsky, Andrew D., to Diamond Shamrock Corp. Production of chromic acid using two-compartment and three-compartment cells. 4,273,628, Cl. 204-87.000.
Kiegel, Einhart: *See*—
Lauer, Karl; and Kiegel, Einhart, 4,273,711, Cl. 260-315.000.
Kii, Masami, to Mitsubishi Denki Kabushiki Kaisha. Circuit interrupter. 4,273,977, Cl. 200-147.00R.
Kikuchi, Toshiro: *See*—
Takeuchi, Shinziro; Kikuchi, Toshiro; Mitsumoto, Norio; Takahashi, Toyoki; Hayashi, Hidekatsu; and Ichioka, Satoshi, 4,273,954, Cl. 178-19.000.
Kilminster, Kenneth N.; and Holstead, Colin, to Eastman Kodak Company. Carbonyl-substituted cyan azo dye-providing materials. 4,273,708, Cl. 260-199.000.
Kim, Young D., to Ashland Oil, Inc. Preparation of furan polymers. 4,273,693, Cl. 260-29.20N.
Kimura, Kiyoshi: *See*—
Fujita, Hisao; and Kimura, Kiyoshi, 4,273,843, Cl. 430-30.000.
Kimura, Shoichi; Takahashi, Toshihiko; and Tamura, Zensuke, to Hitachi, Ltd. Refining process of hot gas containing hydrogen sulfide and ammonia. 4,273,749, Cl. 423-231.000.
Kimura, Shoichi: *See*—
Takahashi, Toshihiko; Maruko, Morihisa; and Kimura, Shoichi, 4,273,748, Cl. 423-230.000.
Kimura, Shoji; and Ishida, Noboru, to Nippon Oil Company Ltd. Rust inhibitors and compositions of same. 4,273,673, Cl. 252-396.000.
Kimura, Takeo: *See*—
Hayashi, Yoshio; Matsui, Takeki; Shiga, Tetsuo; Akashi, Kageyasu; Akiyama, Minoru; and Kimura, Takeo, 4,273,723, Cl. 260-414.000.
King, Donald W.: *See*—
Norvell, Gordon S.; and King, Donald W., 4,273,282, Cl. 228-116.000.
King, Francis D.: *See*—
Hadley, Michael S.; and King, Francis D., 4,273,778, Cl. 424-265.000.
King, Jeanne A.: *See*—
Bates, Edson C.; and King, Jeanne A., 4,273,012, Cl. 83-17.000.
Kinghorn, Mark D., Jr.: *See*—
Kinghorn, Mark D., Sr.; and Kinghorn, Mark D., Jr., 4,273,250, Cl. 220-220.000.
Kinghorn, Mark D., Sr.; and Kinghorn, Mark D., Jr. Sealing system for liquid storage tanks. 4,273,250, Cl. 220-220.000.
Kinjo, Hisao: *See*—
Wada, Yoshiyo; Goto, Kunio; and Kinjo, Hisao, 4,273,967, Cl. 369-126.000.
Kirin Beer Kabushiki Kaisha: *See*—
Yokokura, Shuichi; Horie, Yu; Takamizawa, Minoru; Inoue, Yoshio; and Yoshioka, Hiroshi, 4,273,834, Cl. 428-429.000.
Kirkpatrick, Joel L., to Gulf Oil Corporation. 2-[3-(4-Chlorophenoxy)-propylthio]-5-(1,3,3-trimethylureido)-1,3,4-thiadiazole and use as a post-emergent herbicide. 4,273,574, Cl. 71-90.000.
Kisaka, Hiroyuki: *See*—
Miyahara, Masayoshi; Katayama, Morimitsu; and Kisaka, Hiroyuki, 4,273,001, Cl. 74-359.000.
Kishi, Akira: *See*—
Minematsu, Hiroyuki; Matsumoto, Kojiro; Saeki, Tadashi; and Kishi, Akira, 4,273,895, Cl. 525-264.000.
Kitakohji, Toshisuke: *See*—
Yoneda, Yasuhiro; Kitakohji, Toshisuke; and Kitamura, Kenro, 4,273,856, Cl. 430-270.000.
Kitamura, Kenro: *See*—
Yoneda, Yasuhiro; Kitakohji, Toshisuke; and Kitamura, Kenro, 4,273,856, Cl. 430-270.000.
Kiwala, Jacob: *See*—
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,273,662, Cl. 252-8.900.
Kjaer, Per. Device for collecting and removing dog droppings or the like. 4,273,370, Cl. 294-1.00B.
Kjellstrand, Gunnar M. T.; Olofsson, Olof; and Linder, Anders G. Coupling of the ball-and-socket joint type. 4,273,461, Cl. 403-125.000.
Kleiner, Fredric: *See*—
Fariel, Harry F.; Rudolph, Marvin J.; Hynson, Richard B.; Roy, Pradip K.; and Kleiner, Fredric, 4,273,793, Cl. 426-572.000.
Klemm, Ernest J.; Edman, Walter W.; Erskine, Frances E.; and McDonough, Everett G., to Zotos International, Inc. Permanent wave composition. 4,273,143, Cl. 132-7.000.
Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Kramer, Peter, 4,273,378, Cl. 296-146.000.
Pluequet, Heinz, 4,273,080, Cl. 123-41.500.
Tholen, Paul, 4,273,082, Cl. 123-41.310.
Kloek, Bernard F.: *See*—
Foley, James P.; Kloek, Bernard F.; and D'Agostino, Michael, 4,273,969, Cl. 179-156.00A.
Knacke, Ottmar: *See*—
Dotsch, Erwin; Potschke, Jurgen; and Knacke, Ottmar, 4,273,810, Cl. 427-156.000.
Knight, Robert M.: *See*—
Hendricks, Donald B.; and Knight, Robert M., 4,274,145, Cl. 364-557.000.
Knobel, Walter, to Davy International AG. Process for reconcentrating moist glycol. 4,273,620, Cl. 203-18.000.

Knogo Corporation: *See*—
Cooper, Michael N., 4,274,090, Cl. 340-572.000.

Knowles, Peter G.: *See*—
Nerurkar, Mohanlal S.; and Knowles, Peter G., 4,274,025, Cl. 310-215.000.

Kobayashi, Fumiaki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Device for preventing air-conditioning warm or cool blast from blowing through under a seat. 4,273,375, Cl. 296-65.00R.

Kobayashi, Hajime; Yano, Yasuhiro; and Endo, Ichiro, to Canon Kabushiki Kaisha. Heat-developable photosensitive member for forming electrostatic printing masters. 4,273,844, Cl. 430-48.000.

Kobayashi, Hajime; Yano, Yasuhiro; and Endo, Ichiro, to Canon Kabushiki Kaisha. Heat-developable photosensitive material. 4,273,845, Cl. 430-48.000.

Kobe, Inc.: *See*—
Erickson, John W.; Brown, F. Barton; and White, Thomas A., Jr., 4,273,509, Cl. 415-111.000.

Kobe Steel, Limited: *See*—
Fujita, Isao; Imanishi, Nobuyuki; Tsutaya, Tadao; Watanabe, Ryo; and Kawai, Takao, 4,273,577, Cl. 75-41.000.

Koch, Bernd: *See*—
Fischer, Otto; Pulvermacher, Wilfried; and Koch, Bernd, 4,273,949, Cl. 13-35.000.

Kochansky, Jan P.; Feldmesser, Julius; and Robbins, William E., to United States of America, Agriculture. Control of nematodes and other helminths. 4,273,768, Cl. 424-222.000.

Koebel, Ralph F.: *See*—
Bush, Charles N.; Daniels, Charles A.; and Koebel, Ralph F., 4,273,904, Cl. 526-91.000.

Koehler, F. Theodore; Micchelli, Albert L.; and Nowak, Frank A., Jr., to National Starch and Chemical Corporation. Shampoo compositions. 4,273,760, Cl. 424-70.000.

Koehler, Rudolph A., to Noma Lites Canada Limited. Artificial shrubs of improved construction. 4,273,814, Cl. 428-8.000.

Koeman, Henriecus: *See*—
Brodie, Benjamin T.; and Koeman, Henriecus, 4,274,143, Cl. 364-483.000.

Koeneker, William V.; and Newkirk, Franklin D., to UMC Industries, Inc. Flood control for a beverage vendor. 4,273,259, Cl. 222-108.000.

Koernig, Wolfgang: *See*—
Heilen, Gerd; Nissen, Axel; Koernig, Wolfgang; Horner, Michael; Fliege, Werner; and Boettger, Guenter, 4,273,945, Cl. 568-420.000.

Kohn, Edward M.; Nickol, Stephen L.; and Thompson, Robert M., to Suntech, Inc. Block copolymer of polyetheramide and random copolymer of polyamide and polyetheramide. 4,273,898, Cl. 525-432.000.

Kohnke, Ole B.: *See*—
Grane, Christian; and Kohnke, Ole B., 4,273,126, Cl. 128-276.000.

Koike, Takashi: *See*—
Nishiyama, Ryota; Koike, Takashi; and Seino, Shunji, 4,273,825, Cl. 428-223.000.

Kojima, Takeshi: *See*—
Shimatake, Hirokazu; Natsume, Kenzo; Kojima, Takeshi; Ogawa, Shuichi; Nara, Ryuichi; Uchida, Shigeru; and Takagishi, Haruyoshi, 4,273,504, Cl. 414-728.000.

Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Yamamoto, Takaya; Sakai, Kazuo; and Akiba, Shigeyuki, 4,274,103, Cl. 357-13.000.

Kolakowski, Michael A., to NL Industries, Inc. Desulfation of battery mud. 4,273,746, Cl. 423-92.000.

Kolene Corp: *See*—
Wood, William G.; and Pilznienski, John F., 4,273,591, Cl. 134-11.000.

Koleske, Joseph V.: *See*—
Carder, Charles H.; and Koleske, Joseph V., 4,273,633, Cl. 204-159.170.

Kolling, William J., Jr. Telecommunications access apparatus. 4,273,957, Cl. 179-1.0PC.

Komatsu, Shinichiro: *See*—
Harada, Tadao; Izumi, Yoshiharu; and Komatsu, Shinichiro, 4,273,933, Cl. 560-179.000.

Koninklijke Emballage Industrie Van Leer B.V.: *See*—
Wolff, Per L., 4,273,887, Cl. 521-188.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Fujita, Hisao; and Kimura, Kiyoshi, 4,273,843, Cl. 430-30.000.
Nagoshi, Mitsuru, 4,273,441, Cl. 355-67.000.

Konrath, Karl: *See*—
Hofer, Gerald; Konrath, Karl; Eheim, Franz; Weiss, Otmar; Schmitt, Edgar; Faupel, Werner; and Gotz, Edgar, 4,273,090, Cl. 123-502.000.
Stumpp, Gerhard; Greiner, Max; Weiss, Otmar; and Konrath, Karl, 4,273,091, Cl. 123-506.000.

Kopaska, Arnold F. Machine for rolling crops into round bales. 4,273,036, Cl. 100-88.000.

Kopich, Leonard F., to General Motors Corporation. Hydraulically controlled differential. 4,272,993, Cl. 74-711.000.

Korach, Malcolm, to PPG Industries, Inc. Solid polymer electrolyte chlor-alkali process and electrolytic cell. 4,273,629, Cl. 204-98.000.

Korf, Heinz L. Urea-formaldehyde polymers having reduced formaldehyde emission and cellular urea formaldehyde foam which is resistant to acid-induced hydrolysis. 4,273,883, Cl. 521-113.000.

Koritala, Sambasivarao, to United States of America, Agriculture. Method of enhancing activity of homogeneous Ziegler-type copper catalysts. 4,273,722, Cl. 260-409.000.

Korytov, Vladimir A.: *See*—
Tertishnikov, Anatoly S.; Platunov, Boris P.; Novikov, Alexei V.; Gordeev, Nikolai A.; Belebashev, Eduard K.; Lovtsov, Dmitry P.; Korytov, Vladimir A.; and Ignatiev, Jury P., 4,273,180, Cl. 164-49.000.

Korzeb, Frank: *See*—
Bayly, William I.; Rumbolo, Louis J.; Fazekas, Ernest E.; and Korzeb, Frank, 4,273,493, Cl. 414-221.000.

Kosaka, Takao; and Tahara, Yukio, to Mitsubishi Paper Mills, Ltd. Heat-sensitive recording material. 4,273,602, Cl. 156-234.000.

Kostka, Hana, to Siemens Aktiengesellschaft. Method for operating combustion devices. 4,273,560, Cl. 48-212.000.

Kostner, Armin; Lenhart, Richard; and Bittner, Klaus-Jurgen, to Hoechst Aktiengesellschaft. Double-walled hollow rod of flexible tubular material. 4,273,551, Cl. 493-243.000.

Kotulla, Bernhard; Haas, Hans; Weiser, Martin; Forster, Rolf; Preis, Lothar; and Schmidt, Rudolf, to Bayer Aktiengesellschaft. Reinforcement of armored earth work constructions. 4,273,476, Cl. 405-258.000.

Koyanagi, Rokuo; Fujita, Yoshio; and Mukai, Kunio, to Sumitomo Chemical Company, Limited. O-Ethyl S-alkyl S-isopropyl phosphoro-dithiolate, and their use as nematocide. 4,273,769, Cl. 424-224.000.

Kozima, Yasuyuki, to Hitachi, Ltd. Picture information transmitting method for facsimile. 4,274,114, Cl. 358-257.000.

Kraemer, Horst, to Siemens Aktiengesellschaft. Reference voltage source, in particular for amplifier circuits. 4,274,061, Cl. 330-296.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Exner, Gerhard; and Festinori, Volfango, 4,273,011, Cl. 81-57.380.

Krall, Albert D.; and Syeles, Albert M., to United States of America, Navy. Embedded dielectric rod antenna. 4,274,097, Cl. 343-719.000.

Kramer, Peter, to Klockner-Humboldt-Deutz Aktiengesellschaft. Vehicle door, especially for a driver's cab. 4,273,378, Cl. 296-146.000.

Kraskin, Kenneth S., to Personal Products Company. Inhibition of conditions arising from microbial production of ammonia. 4,273,786, Cl. 424-319.000.

Kratzer, Rudolf: *See*—
Heine, Helmut A.; Rosenbusch, Helmut W.; and Kratzer, Rudolf, 4,273,112, Cl. 128-11.000.

Krauss, Werner, to Claudius Peters AG. Mixing chamber silo with improved mixing. 4,273,451, Cl. 366-101.000.

Kray, George C. Trigger actuated air pressure dispensing gun. 4,273,270, Cl. 222-327.000.

Krein, Reuben J., to Coachmen Industries, Inc. Apparatus for stuffing compressible products into flexible covers. 4,272,874, Cl. 29-235.000.

Krenek, Michael J.: *See*—
Piazza, Andre L.; Krenek, Michael J.; and Ames, Thomas J., 4,273,472, Cl. 405-211.000.

Krespan, Carl G., to Du Pont de Nemours, E. I., and Company. Polyfluoroallyloxy compounds, their preparation and copolymers therefrom. 4,273,728, Cl. 260-465.600.

Krespan, Carl G., to Du Pont de Nemours, E. I., and Company. Polyfluoroallyloxy compounds, their preparation and copolymers therefrom. 4,273,729, Cl. 260-543.00F.

Krijl, Gerrit: *See*—
Van de Leest, Renaat E.; Krijl, Gerrit; and Boonzajer Flaes, Ewoud A., 4,273,625, Cl. 204-56.00R.

Krohn, David A.; Snitzer, Elias; and Raber, Peter E., to Exxon Research & Engineering Co. Sealing glass. 4,273,585, Cl. 106-47.00R.

Kronogard, Sven-Olof, to United Turbine AB & Co., Kommanditbolag. Gas turbine having a ceramic rotor. 4,272,954, Cl. 60-39.16R.

Krueger, Robert H., to Borg-Warner Corporation. Device for automatic addition of a corrosion inhibitor to a coolant system. 4,273,744, Cl. 422-265.000.

Krueger, Wallace F. Metering apparatus. 4,273,261, Cl. 222-135.000.

Kruger, Manfred: *See*—
Berndt, Klaus-Gunther; Kruger, Manfred; and Nawrot, Wolfgang, 4,273,979, Cl. 200-286.000.

Kubler, Hans: *See*—
Benckendorff, Wolfgang; and Kubler, Hans, 4,274,086, Cl. 340-506.000.

Kubo, Kimio; and Miyamae, Ryuichi, to Sharp Kabushiki Kaisha. Electronic sphygmomanometer. 4,273,136, Cl. 128-680.000.

Kubo, Masaharu: *See*—
Ohba, Shinya; Tanaka, Shuhei; Kubo, Masaharu; Ando, Haruhisa; Yamashita, Yataro; Hanamura, Shoji; Aoki, Masakazu; and Nakai, Masaaki, 4,274,113, Cl. 358-212.000.

Kubota, Ltd.: *See*—
Miyahara, Masayoshi; Katayama, Morimitsu; and Kisaka, Hiroyuki, 4,273,001, Cl. 74-359.000.
Nakai, Osamu, 4,273,308, Cl. 251-88.000.
Sato, Mitsuhiro; Itatani, Hiroshi; and Matsuda, Kenji, 4,273,007, Cl. 74-745.000.

Kuchuk-Yatsenko, Sergei I.: *See*—
Paton, Boris E.; Scherbina, Boris E.; Lebedev, Vladimir K.; Ivantsov, Oleg M.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; Galian, Boris A.; Unigovsky, Mikhail R.; and Serafin, Orest M., 4,273,985, Cl. 219-101.000.

Kuehnel, Werner; and Rattner, Manfred, to Siemens Aktiengesellschaft. X-ray diagnostic generator comprising means for obtaining a signal corresponding to the x-ray tube voltage. 4,274,003, Cl. 250-409.000.

Kugelfischer Georg Schafer & Co.: *See*—
Voll, Horst, 4,273,229, Cl. 192-105.0CF.

Kugler, Edwin L.; and Garten, Robert L., to Exxon Research & Engineering Co. Hydrocarbon synthesis from CO and H_2 using titanium promoted bulk nickel catalysts. 4,273,724, Cl. 518-715.000.

Kuhle, Engelbert; Hagemann, Hermann; Behrenz, Wolfgang; Hammann, Ingeborg; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Combating plant pests with phosphorylated carbamoyl compounds. 4,273,767, Cl. 424-211.000.

Kuhlmann, Herbert, to Sidepal Societe Anonyme Societe Industrielle de Participations Luxembourgeois. Cooling device for hot gases in pipes. 4,273,074, Cl. 122-7.00R.

Kuhlmann, Robert: *See*—
Nauroth, Peter; Esch, Heinz; Kuhlmann, Robert; Bode, Rudolf; Reisert, Arthur; Buhler, Harald; and Turk, Gunter, 4,273,589, Cl. 106-308.00Q.

Kumagai, Yoshio, to Hitachi, Ltd. Steam generating apparatus. 4,272,964, Cl. 60-657.000.

Kume, Kazunari; Watanabe, Minoru; Ohno, Hideshi; and Tamaru, Munetaka, to Citizen Watch Company Limited. Movement construction for electronic timepiece. 4,274,153, Cl. 368-80.000.

Kunreuther, Steven. High strength needle assembly with sharpenable cutting edge. 4,273,279, Cl. 227-67.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Kato, Tadaaki, 4,273,705, Cl. 260-123.700.
Shiiki, Zenya; and Watanabe, Kazuhiro, 4,273,675, Cl. 252-424.000.

Kusahara, Kohji: *See*—
Endo, Makoto; and Kusahara, Kohji, 4,273,754, Cl. 423-385.000.

Kushi, Kenji: *See*—
Kamada, Kazumasa; Kushi, Kenji; Yoshihara, Keisuke; and Nakamoto, Hideo, 4,273,799, Cl. 427-44.000.
Kamada, Kazumasa; Kushi, Kenji; Yoshihara, Keisuke; and Nakamoto, Hideo, 4,273,802, Cl. 427-54.100.

Kushida, Shozo: *See*—
Ikenishi, Masataka; Miyazaki, Joichi; Kushida, Shozo; Nakanishi, Hiromasa; Ueda, Makoto; and Shida, Masaharu, 4,274,150, Cl. 368-185.000.

Kuwakado, Satosi: *See*—
Takei, Toshihiro; Kuwakado, Satosi; Takakuwa, Eiji; and Shimogawa, Toshiaki, 4,273,361, Cl. 280-805.000.

Kwong, Hanoi: *See*—
Rosser, Robert W.; Shalhoub, Ibrahim M.; and Kwong, Hanoi, 4,273,918, Cl. 528-310.000.

Kyllonen, Allen W.: *See*—
Morris, Robert B.; and Kyllonen, Allen W., 4,273,218, Cl. 188-18.00A.

Kyowa Hakko Kogyo Co., Ltd.: *See*—
Nakanishi, Toru; and Shigemasa, Yoshimi, 4,273,874, Cl. 435-191.000.

La Societe Pyral: *See*—
Peronnet, Roland; Couturier, Bernard; and Fombert, Christian, 4,273,603, Cl. 156-236.000.

Laboratorios Bago S.A.: *See*—
Los, Mario A., 4,273,777, Cl. 424-263.000.

Laethem, Alfred F.: *See*—
Carr, Peter; and Laethem, Alfred F., 4,273,839, Cl. 429-51.000.

Lafargue, Marcel A. S.: *See*—
Mouille, Rene L.; and Lafargue, Marcel A. S., 4,273,511, Cl. 416-134.00A.

Laferty, John M.; Howe, Dennis L.; and Sebenik, Roger F., to AMAX Inc. Production of molybdenum oxide from ammonium molybdate solutions. 4,273,745, Cl. 423-54.000.

Lagneaux, Jean, to Societe Generale pour l'Emballage. Dispensing head for beverages. 4,273,288, Cl. 239-419.300.

Lahoda, Edward J.; and Dent, Thomas H., to Westinghouse Electric Corp. Steam generator sludge lancing apparatus. 4,273,076, Cl. 122-382.000.

Laitinen, Herbert A.; and Thornton, Donald C., to Board of Regents, State of Florida, for the use and benefit of the University of Florida. Thin platinum films on tin oxide substrates. 4,273,624, Cl. 204-23.000.

LaLiberte, Norman U.; and Rotenberg, Don H., to American Optical Corporation. Method of preparing cast resin lenses. 4,273,809, Cl. 427-155.000.

Lamberti, Vincent: *See*—
Gutierrez, Eddie N.; and Lamberti, Vincent, 4,273,935, Cl. 562-595.000.

Lambot, Joseph H., to Diamant Boart. Drive mandrel for a drilling stem. 4,273,200, Cl. 173-166.000.

Lamere, Garland C.; Inman, Frank S.; and Mitchell, Ronald B., to Thiokol Corporation. Time delay device for deployable rocket nozzle skirts. 4,272,956, Cl. 60-242.000.

Lamprey, Donald F. Compact variable speed drive for electric motor. 4,274,023, Cl. 310-83.000.

Lamson & Sessions Co., The: *See*—
Capuano, Terry D., 4,273,175, Cl. 411-168.000.

Lane, George A.; and Rossow, Harold E., to Dow Chemical Company, The. Hydrated $Mg(NO_3)_2$ reversible phase change compositions. 4,273,666, Cl. 252-70.000.

Lane, Ruth M.; and Stacey, Martyn H., to Imperial Chemical Industries Limited. Method of preparing an oxychlorination catalyst. 4,273,678, Cl. 252-463.000.

Lange, Gerald A.; and Simpson, Charles J., to Eastman Kodak Company. Instant film unit. 4,273,852, Cl. 430-209.000.

Langer, Roger L.; Licht, Richard R.; and Marlor, Alan J., to Minnesota Mining and Manufacturing Company. Intumescent fire retardant composites. 4,273,879, Cl. 521-91.000.

Lapierre, Philippe. Airplane model with flexible strut assembly. 4,272,912, Cl. 46-79.000.

Larimore, Franklin C.; and Heilmann, Steven M., to Minnesota Mining and Manufacturing Company. Biomedical electrode. 4,273,135, Cl. 128-640.000.

Larkey, Orval W., to J. T. Posey Company. Golf swing aid. 4,273,336, Cl. 273-189.00R.

Larsen, Donald W.: *See*—
Wood, Louis L.; and Larsen, Donald W., 4,273,913, Cl. 528-77.000.

Lary, Banning G. Coronary cutting and dilating instrument. 4,273,128, Cl. 128-305.000.

Lauber, Leo E.: *See*—
Cowden, Ernest A.; and Lauber, Leo E., 4,272,934, Cl. 52-202.000.

Lauer, Karl; and Kiegel, Einhart, to Boehringer Mannheim GmbH. Process for the preparation of 4-hydroxycarbazole. 4,273,711, Cl. 260-315.000.

Laurie, Alec H.; and Kalicki, John H. Gas/liquid exchange apparatus. 4,273,731, Cl. 261-77.000.

Law, Joseph P., to Thomas & Betts Corporation. Jacketed metal clad cable connector. 4,273,405, Cl. 339-94.00R.

Lawing, Pierce L.: *See*—
Frosch, Robert A.; Lawing, Pierce L.; and Pagel, LaVerne L., 4,273,304, Cl. 244-117.00A.

Lawson-Tancred, Henry, to Sir Henry Lawson-Tancred, Sons & Co., Ltd. Electric power generation. 4,274,010, Cl. 290-55.000.

Lay, Giles P., to Layco, Inc. Cyclic energy transformation apparatus. 4,272,963, Cl. 60-655.000.

Layco, Inc.: *See*—
Lay, Giles P., 4,272,963, Cl. 60-655.000.

Layher, Ulrich: *See*—
Sivers, Rolf V.; Herrmann, Rudolf; and Layher, Ulrich, 4,273,207, Cl. 180-70.00P.

Layton, Vincent W.; and Mueller, Ernest. Process for the continuous recovery of gold and other metals from sea water. 4,273,631, Cl. 204-109.000.

Le Metalli Industrialle S.p.A.: *See*—
Blasio, Pietro; and Talini, Maurizio, 4,273,611, Cl. 159-47.0WL.

Leamy, Harry J.: *See*—
Heller, Adam; Leamy, Harry J.; Miller, Barry; Nelson, Ronald J.; and Parkinson, Bruce A., 4,273,594, Cl. 148-33.300.

Lear Siegler, Inc.: *See*—
White, Jack H.; and FitzGerald, Joseph M., 4,272,967, Cl. 62-236.000.

Leatherman, Ivan R., to PPG Industries, Inc. Cobalt aluminate internal colorants for diol bis (allyl carbonate). 4,273,702, Cl. 260-42.530.

Lebedev, Vladimir K.: *See*—
Paton, Boris E.; Scherbina, Boris E.; Lebedev, Vladimir K.; Ivantsov, Oleg M.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; Galian, Boris A.; Unigovsky, Mikhail R.; and Serafin, Orest M., 4,273,985, Cl. 219-101.000.

Leberzammer, Ernst; and Roos, Leo, to Du Pont de Nemours, E. I., and Company. Polymeric binders for aqueous processable photopolymer compositions. 4,273,857, Cl. 430-281.000.

Lederer, Gernot, to Woellner-Werke. Cold hardening binding agent for particulate solids, such as molding sand, containing a nitrogen basic polyol. 4,273,910, Cl. 528-48.000.

Legg, Howard W. Spreader marker having a ground wheel actuated aerosol supply. 4,273,264, Cl. 222-162.000.

Legg, Robert E. Quick miner's pan. 4,273,648, Cl. 209-447.000.

Leggett, Paul. Safety harness for hunters. 4,273,215, Cl. 182-3.000.

Legille, Edouard; and Mailliet, Pierre, to Paul Wurth, S.A. Charging device for shaft furnaces. 4,273,492, Cl. 414-160.000.

Lehmann, Myrtil B., to Chanel. Shaped caps and containers. 4,273,248, Cl. 215-331.000.

Lehnert, Stanley E., to Zenith Radio Corporation. Projection television system. 4,274,110, Cl. 358-60.000.

Lehr, Klaus; Heymer, Gero; Stephan, Hans-Werner; and Thummler, Ursus, to Hoechst Aktiengesellschaft. Process for making red phosphorus. 4,273,752, Cl. 423-322.000.

Lemelson, Jerome H. Syringe and needle cover. 4,273,123, Cl. 128-218.00N.

Lemelson, Jerome H.: *See*—
Ben-Dor, Effraim; and Lemelson, Jerome H., 4,273,345, Cl. 280-11.200.

Lenhart, Richard: *See*—
Kostner, Armin; Lenhart, Richard; and Bittner, Klaus-Jurgen, 4,273,551, Cl. 493-243.000.

Lennon, Donald J. J.; Hagerstrom, John R.; and Ekman, C. Frederick W., to EPP Corp. Inks for pulsed electrical printing and methods of producing same. 4,273,847, Cl. 430-106.000.

Lester, David; and Alexander, Robert R., to Polymerics, Inc. High molecular weight vinyl acrylic combined with low molecular weight vinyl acetate-maleate for controlled permanent tack and method of making same. 4,273,145, Cl. 132-1.00R.

Levens, Joseph A., to Nipak, Inc. Sweep ell production apparatus. 4,273,523, Cl. 425-326.100.

Levenspiel, Octave; and Kamholz, Kenneth, to Exxon Research & Engineering Co. Enhancing the characteristics of magnetically stabilized fluidized beds. 4,272,893, Cl. 34-1.000.

Lever Brothers Company: *See*—
Gutierrez, Eddie N.; and Lamberti, Vincent, 4,273,935, Cl. 562-595.000.

Leverett, William H. Apparatus and process for weighing articles successively. 4,273,649, Cl. 209-539.000.

Levine, Robert A. Device for obtaining stool samples. 4,273,741, Cl. 422-56.000.

Lewis, Clive: *See*—
Cuppleditch, Brian; and Lewis, Clive, 4,273,254, Cl. 221-196.000.

Lewis, Geoffrey A.; and Lloyd, Arthur L., to Lucas Industries Limited. Fuel control system for a ram jet engine. 4,272,957, Cl. 60-243.000.

Leysieffer, Hans; and Panzer, Klaus, to Siemens Aktiengesellschaft. Switching matrix for selectively connecting incoming signals to desired output paths. 4,274,112, Cl. 358-181.000.
Liau, Weilin. Dentifrice and its method of manufacture. 4,273,758, Cl. 424-49.000.
Licht, Richard R.: *See*—
Langer, Roger L.; Licht, Richard R.; and Marlor, Alan J., 4,273,879, Cl. 521-91.000.
Liebling, Gary. Closeable fish net. 4,272,906, Cl. 43-11.000.
Liermann, Peter, to WABCO Fahrzeugbremsen GmbH. System for controlling the speed of an automotive vehicle. 4,273,208, Cl. 180-179.000.
Ligon, Woodfin V., Jr.; and Webb, Jimmy L., to General Electric Company. Thermal detecting paint compositions. 4,273,674, Cl. 252-408.000.
Limited-Liability Company: *See*—
Luther, Erich; and Maelzer, Martin, 4,273,321, Cl. 271-10.000.
Lin, Wayne H. T.; Grib, James J.; and Mosier, Larry D., to Mallinckrodt, Inc. Method and reagent for counteracting lipemic interference. 4,273,867, Cl. 435-7.000.
Linde Aktiengesellschaft: *See*—
Heyl, Walter, 4,273,517, Cl. 417-222.000.
Turnwald, Ernst; Asztalos, Stefan; and Rosenmeier, Rudolf, 4,273,028, Cl. 91-275.000.
Linder, Anders G.: *See*—
Kjellstrand, Gunnar M. T.; Olofsson, Olof; and Linder, Anders G., 4,273,461, Cl. 403-125.000.
Lindsay, Ronald J.; and Cross, Clifford W., to Goodyear Tire & Rubber Company, The. Energy absorbing device. 4,273,065, Cl. 114-219.000.
Ling, Chung-Mei; Decker, Richard H.; and Chairez, Ruben, to Abbott Laboratories. Immunoassay for class specific antibodies. 4,273,756, Cl. 424-1.000.
Lingl Corporation: *See*—
Lingl, Hans, Jr.; and Schwarz, Josef, 4,273,489, Cl. 414-60.000.
Lingl, Hans, Jr.; and Schwarz, Josef, to Lingl Corporation. Process and apparatus for forming of set layers from brick blanks. 4,273,489, Cl. 414-60.000.
Lintonbon, Robert F.: *See*—
Shore, David; and Lintonbon, Robert F., 4,273,514, Cl. 417-15.000.
Liou, Sydarsis. Educational toy. 4,272,896, Cl. 434-340.000.
Lisk, Robert R.: *See*—
Bisczat, John J.; Lisk, Robert R.; McCray, William R.; and Sizemore, James L., 4,273,456, Cl. 400-550.000.
Littner, Lorna C.: *See*—
Carrera, Michael A.; Carrera, June F.; Littner, Melvyn S.; and Littner, Lorna C., 4,273,337, Cl. 273-243.000.
Littner, Melvyn S.: *See*—
Carrera, Michael A.; Carrera, June F.; Littner, Melvyn S.; and Littner, Lorna C., 4,273,337, Cl. 273-243.000.
Litton Industrial Products, Inc.: *See*—
Charland, Raymond J., 4,273,148, Cl. 137-72.000.
Cribbs, Robert W., 4,272,991, Cl. 73-621.000.
Litton Systems, Inc.: *See*—
Norvell, Gordon S.; and King, Donald W., 4,273,282, Cl. 228-116.000.
Litz, Heinz; Hallwirth, Volker; and Storz, Karl, to Dual Gebruder Steidinger. Transmission system for the digital control of devices. 4,274,082, Cl. 340-167.00R.
Litzinger, Bernardo C.; and Schmeling, Udo F. M., to Mineracoes Brasileiras Reunidas S.A. Process for transforming fines of iron or manganese into raw-material for sintering. 4,273,575, Cl. 75-3.000.
Lloyd, Arthur L.: *See*—
Lewis, Geoffrey A.; and Lloyd, Arthur L., 4,272,957, Cl. 60-243.000.
Lloyd, Brian M.: *See*—
LLoyd, William M.; and Lloyd, Brian M., 4,273,482, Cl. 409-80.000.
Lloyd, Samuel H., III; and Goren, Yoram, to Santa Fe International Corporation. Method of operating twin hull semisubmersible derrick barge. 4,273,067, Cl. 114-258.000.
LLoyd, William M.; and Lloyd, Brian M., to Conti-Form Machine Tools Limited. Automatic tool-moving machine. 4,273,482, Cl. 409-80.000.
Locatelli, Jean-Louis: *See*—
Soula, Gerard; and Locatelli, Jean-Louis, 4,273,915, Cl. 528-93.000.
Loch, Ernst: *See*—
Grunder, Werner; and Loch, Ernst, 4,272,868, Cl. 19-240.000.
Locher, Frank S. Lift centering device. 4,273,243, Cl. 212-153.000.
Lofgren, Stig-Gunnar; and Ekeborg, Bo G., to Mo och Domsjo Aktiebolag. Digging and planting machine. 4,273,056, Cl. 111-2.000.
Login, Robert B.: *See*—
Newkirk, David D.; and Login, Robert B., 4,273,946, Cl. 568-625.000.
Long, Leo E.: *See*—
Nall, Clive; Long, Leo E.; Rigby, Sterling C.; and Baugh, K. Boyd, 4,273,327, Cl. 272-97.000.
Long, Thomas J.: *See*—
Steiner, Robert E.; and Long, Thomas J., 4,273,990, Cl. 219-363.000.
Loomis, Ervin C.: *See*—
Keeney, Gary E.; Zurcher, Allen K.; and Loomis, Ervin C., 4,273,367, Cl. 285-419.000.
Looser, Siegfried: *See*—
Mollering, Hans; and Looser, Siegfried, 4,273,870, Cl. 435-26.000.
Lopes, Rosario. Mobile home anchor. 4,272,933, Cl. 52-149.000.
Lori Engineering Corporation: *See*—
Hennessy, Thomas F., 4,272,974, Cl. 70-129.000.
Los, Mario A., to Laboratorios Bago S.A. Methods of treating mammals suffering from inflammation and pain. 4,273,777, Cl. 424-263.000.
Louis N. Graves Co., Inc.: *See*—
Graves, Louis N., 4,272,925, Cl. 51-211.00R.
Lovejoy, Inc.: *See*—
James, Ian R., 4,272,972, Cl. 64-17.0SP.
Lovtsov, Dmitry P.: *See*—
Tertishnikov, Anatoly S.; Platunov, Boris P.; Novikov, Alexei V.; Gordeev, Nikolai A.; Belebashev, Eduard K.; Lovtsov, Dmitry P.; Korytov, Vladimir A.; and Ignatiev, Jury P., 4,273,180, Cl. 164-49.000.
Lowles, David C., to Parker-Hannifin Corporation. High pressure hose. 4,273,160, Cl. 138-124.000.
Lowry, Robert K.; and Miller, Larry A., to Harris Corporation. Method and means for measuring moisture content of hermetic semiconductor devices. 4,272,986, Cl. 73-73.000.
Loyd, Morris S.; and McGann, Timothy W., to Rockwell International Corporation. Reinforced tubular structure. 4,272,971, Cl. 64-1.00S.
Lubbers, Dietrich W., to Max Planck Gesellschaft zur Forderung der Wissenschaften e.V. Spectral photometer for medical applications. 4,273,442, Cl. 356-326.000.
Lubrizol Corporation, The: *See*—
Pindar, John F.; Cohen, Jerome M.; and Bryant, Charles P., 4,273,891, Cl. 525-145.000.
Lucas Industries Limited: *See*—
Farr, Glyn P. R., 4,273,386, Cl. 303-6.00C.
Lewis, Geoffrey A.; and Lloyd, Arthur L., 4,272,957, Cl. 60-243.000.
Tregurtha, Steven J., 4,273,971, Cl. 200-4.000.
Lucas, Jean-Claude; and Messirejean, Pierre, to Societe Sofiltra-Poelman; and Societe Industrielle de Filtration. Installation for filtration of a contaminated fluid. 4,273,652, Cl. 210-189.000.
Luck, Russell M.; and Gainer, Gordon C., to Westinghouse Electric Corp. Submersible fuse. 4,274,073, Cl. 337-248.000.
Ludlow Corporation: *See*—
Carrier, Lee A.; and Carpenter, Leon G., 4,273,362, Cl. 283-6.000.
Ludwig, George C., to Tom McGuane Industries, Inc. Three way butterfly valve. 4,273,157, Cl. 137-887.000.
Lueg, Heinz: *See*—
Hermanns, Winfried; Lueg, Heinz; Blackert, Hanno; and Wimmenauer, Dirk, 4,274,076, Cl. 340-38.00L.
Luk Lamellen und Kupplungsbau GmbH: *See*—
Huber, Lothar, 4,273,228, Cl. 192-89.00B.
Lukas, Sidney; Golden, Timothy E.; Lunarola, Patrick J.; and Mard, Michael G., to Retro-Flex, Inc. Field-installed insulation and apparatus for and method of making and installing the same. 4,272,935, Cl. 52-309.110.
Luke, John A., to Brown & Williamson Tobacco Corporation. Bonding fibrillated polypropylene smoke filter with ethylene-vinylacetate emulsion. 4,273,600, Cl. 156-180.000.
Lukes, Henry J.; Kamphorst, Walter; and Asmar, Romeal F., to Sundstrand Data Control, Inc. Charge amplifier with minimum offset voltage. 4,274,056, Cl. 328-162.000.
Lukianov, Nikolai E.: *See*—
Fomichev, Mikhail M.; Schepakin, Mikhail B.; Gudz, Anatoly G.; Evdokimov, Viktor G.; Lukianov, Nikolai E.; Romanchenko, Irina A.; and Salnikov, Andrei F., 4,273,508, Cl. 415-1.000.
Lum, Victor. Multi-element writing instrument. 4,274,102, Cl. 346-139.00R.
Lummus Company, The: *See*—
Fornoff, Louis L., 4,273,621, Cl. 203-19.000.
Lunarola, Patrick J.: *See*—
Lukas, Sidney; Golden, Timothy E.; Lunarola, Patrick J.; and Mard, Michael G., 4,272,935, Cl. 52-309.110.
Lundberg, Thorsten, to Gotaverken Arendal AB. Floating dock. 4,273,061, Cl. 114-45.000.
Lunde, Peter A., to Santa Fe International Corporation. System and method for laying subsea pipelines. 4,273,469, Cl. 405-158.000.
Luo, Zong S.; and Woodcock, Todd M., to Hewlett Packard Company. Impact printing apparatus and method using reluctance switching and a closed loop drive system. 4,273,039, Cl. 101-93.020.
Lurssen, Klaus: *See*—
Grohe, Klaus; and Lurssen, Klaus, 4,273,573, Cl. 71-90.000.
Luther, Erich; and Maelzer, Martin, to Luther & Maelzer GmbH; and Limited-Liability Company. Apparatus for feeding conductor plates into a conductor plate tester. 4,273,321, Cl. 271-10.000.
Luther & Maelzer GmbH: *See*—
Luther, Erich; and Maelzer, Martin, 4,273,321, Cl. 271-10.000.
Lynn, Peter F.: *See*—
Favin, David L.; Lynn, Peter F.; and Snyder, Paul J., 4,273,970, Cl. 179-175.30R.
Maatschappij van Berkel's Patent N.V.: *See*—
De Voogd, Albert H., 4,273,205, Cl. 177-210.0FP.
MacDonald, Digby D.; and Scott, Arthur C., to Electric Power Research Institute, Inc. Pressure balanced external reference electrode assembly and method. 4,273,637, Cl. 204-195.00F.
Machi, Sueo; Ishigaki, Isao; Sugo, Takanobu; Murata, Kazuo; Tanso, Shiro; and Senoo, Keizi, to Japan Atomic Energy Research Institute; and Yuasa Battery Co. Ltd. Battery separator and method of producing the same. 4,273,840, Cl. 429-144.000.
Machida, Saneto, to Toshin Kogyo Co., Ltd. Automatic screen printing process and apparatus. 4,273,042, Cl. 101-123.000.

Mackie, Robert D. Mutes for wind instruments. 4,273,021, Cl. 84-400.000.

MacLarty, Bernard G.; and Sidders, Bryan, to Promex Plastics (Proprietary) Limited. Identity band. 4,272,900, Cl. 40-21.00C.

MacLaury, Michael R.; and Holub, Fred F., to General Electric Company. Flame retardant compositions and coated article. 4,273,691, Cl. 260-23.00S.

Madgavkar, Ajay M.: *See*—
Vogel, Roger F.; Madgavkar, Ajay M.; and Swift, Harold E., 4,273,188, Cl. 166-256.000.

Maelzer, Martin: *See*—
Luther, Erich; and Maelzer, Martin, 4,273,321, Cl. 271-10.000.

Maher, Jack; and Francis, Grosvenor F. Mobile hammer-mill. 4,272,946, Cl. 56-13.500.

Mahoney, Thomas P.: *See*—
Campbell, James R.; and Anspach, Roy L., 4,273,836, Cl. 428-595.000.

Maier, Thomas A., to Essex Group, Inc. Open loop computer-controlled spark ignition timing system. 4,273,089, Cl. 123-417.000.

Mail-Ex Corporation: *See*—
Russell, Robert J., 4,272,943, Cl. 53-492.000.

Mailliet, Pierre: *See*—
Legille, Edouard; and Mailliet, Pierre, 4,273,492, Cl. 414-160.000.

Maitani, Yoshihisa; and Sato, Yuichi, to Olympus Optical Co., Ltd. Photographic camera. 4,273,434, Cl. 354-288.000.

Major Sports Sales, Inc.: *See*—
Nall, Clive; Long, Leo E.; Rigby, Sterling C.; and Baugh, K. Boyd, 4,273,327, Cl. 272-97.000.

Makimoto, Tsutomu: *See*—
Shimada, Kiyoo; Yano, Makoto; Shibatani, Kyoichiro; and Makimoto, Tsutomu, 4,273,636, Cl. 204-195.00P.

Malburg, Werner: *See*—
Sepp, Gunther; Born, Gunthard; and Malburg, Werner, 4,274,064, Cl. 331-94.50G.

Malinski, Richard F.; and Sikorcin, John, to Vapor Corporation. Clutch for valve actuator. 4,273,307, Cl. 251-69.000.

Malis, Leonard I. Friction hinged headlamp or the like. 4,274,128, Cl. 362-105.000.

Mallinckrodt, Inc.: *See*—
Juranas, David L., 4,273,557, Cl. 23-230.00B.
Lin, Wayne H. T.; Grib, James J.; and Mosier, Larry D., 4,273,867, Cl. 435-7.000.

Malone, Richard L.: *See*—
Smith, Jay, III; and Malone, Richard L., 4,272,917, Cl. 46-254.000.

Mamiya Koki Kabushiki Kaisha (Mamiya Camera Co., Ltd.): *See*—
Nanjoh, Yuhsuke, 4,273,424, Cl. 350-431.000.

Manabe, Toshikatsu: *See*—
Nonogaki, Saburo; Morishita, Hajime; Hashimoto, Michiaki; Manabe, Toshikatsu; Tomita, Yoshifumi; and Nishizawa, Masahiro, 4,273,842, Cl. 430-25.000.

Mangold, Hans, to Grundig E.M.V. System for the recording and play-back of video signals. 4,274,118, Cl. 360-84.000.

Manis, Jack J., to Upjohn Company, The. Plasmid and process of isolating same. 4,273,875, Cl. 435-253.000.

Mansheim, James W.; and Martz, William M., to Textron Inc. Writing implement. 4,273,458, Cl. 401-109.000.

Mar, Danny M., to Envirotech Corporation. Determination of total organic carbon in an aqueous sample containing halide ion. 4,273,558, Cl. 23-230.0PC.

Marathon LeTourneau Company: *See*—
Schaper, Donald W., 4,273,242, Cl. 212-147.000.

Marchello, John L. Breathing mask for horses. 4,273,119, Cl. 128-201.130.

Marchesi, Sergio; and Fachin, Gino, to Vianini, S.p.A. Process and apparatus for manufacturing single piece railroad ties of prestressed concrete. 4,273,740, Cl. 264-228.000.

Marconi Company Limited, The: *See*—
Molyneux-Berry, Robert B., 4,274,132, Cl. 363-21.000.

Mard, Michael G.: *See*—
Lukas, Sidney; Golden, Timothy E.; Lunarola, Patrick J.; and Mard, Michael G., 4,272,935, Cl. 52-309.110.

Marino, Joseph T., Jr., to Motorola, Inc. Flexible mode DES system. 4,274,085, Cl. 340-347.0DD.

Marjollet, Jacques: *See*—
Bessouat, Roger; and Marjollet, Jacques, 4,273,077, Cl. 122-483.000.

Mark, Victor; and Wilson, Phillip S., to General Electric Company. Polycarbonate composition containing halogen-free organotin plasticizer. 4,273,692, Cl. 260-29.10R.

Mark, Victor; and Wilson, Phillip S., to General Electric Company. Plasticized polycarbonate composition. 4,273,942, Cl. 568-42.000.

Marker, Hannes; and Huss, Otto, to Marker, Hannes. Device for connecting a sailmast to a sailboard. 4,273,062, Cl. 114-91.000.

Markham, Harvey R.; and Shepherd, Roger D., to International Business Machines Corporation. Document feeder system having a suspending/commencing mode with a judgment decision capability. 4,273,439, Cl. 355-14.00C.

Markus, Henry Z.: *See*—
McAleer, William J.; and Markus, Henry Z., 4,273,762, Cl. 424-89.000.

Marlor, Alan J.: *See*—
Langer, Roger L.; Licht, Richard R.; and Marlor, Alan J., 4,273,879, Cl. 521-91.000.

Marmet, Melvin L.: *See*—
Padgett, Clarence W.; Marmet, Melvin L.; and Tennyson, Mark R., 4,274,147, Cl. 365-189.000.

Marquip, Inc.: *See*—
Rodewald, Dennis W., 4,273,325, Cl. 271-220.000.

Marsden, James G.: *See*—
Pepe, Enrico J.; and Marsden, James G., 4,273,694, Cl. 260-29.20E.

Marshall, Dennis; and Murfitt, Harry C., to Imperial Chemical Industries Limited. Polyvinylchloride compositions containing phenoxy alkanol dicarboxylic acid ester plasticizers. 4,273,696, Cl. 260-31.40R.

Marshall, Larry J., to Raychem Corporation. Taped products processor. 4,273,252, Cl. 221-13.000.

Martel, Jacques; Tessier, Jean; Teche, Andre; and Demoute, Jean-Pierre, to Roussel Uclaf. (S) α-Cyano-3-phenoxy-benzyl alcohol. 4,273,727, Cl. 260-465.00F.

Martin, Eugene R., to SWS Silicones Corporation. Silylated polymers and silylated organic-organopolysiloxane block copolymers. 4,273,896, Cl. 525-271.000.

Martin, Jerry R.; Tadanier, John S.; and Collum, Paulette, to Abbott Laboratories. 2-O-Hydrocarbonsulfonyl-4,5-oxazolidine fortimicin B derivatives. 4,273,924, Cl. 536-17.00R.

Martin, Jerry R.; Tadanier, John S.; and Johnson, Paulette, to Abbott Laboratories. 1,2-Modified fortimicins A and B, intermediates therefor and method for their manufacture. 4,273,925, Cl. 536-17.00R.

Martin, John K., III: *See*—
Whitney, Douglass G.; and Martin, John K., III, 4,273,122, Cl. 128-218.00A.

Martin, Thomas F., to Rockwell International Corporation. Voltage measuring apparatus. 4,274,050, Cl. 324-99.00D.

Martinez, John; and Britt, Lilla V. Adjustable box. 4,273,395, Cl. 312-205.000.

Martino, Peter V. Label making apparatus. 4,273,043, Cl. 101-143.000.

Martushev, Daniel. Embroidery needle assembly. 4,273,058, Cl. 112-80.000.

Martz, William M.: *See*—
Mansheim, James W.; and Martz, William M., 4,273,458, Cl. 401-109.000.

Marubeni Kogyo K.K.: *See*—
Kajita, Tosifumi, 4,273,217, Cl. 187-9.00R.

Marui, Masatoshi: *See*—
Tuda, Koji; Nagashima, Hironobu; and Marui, Masatoshi, 4,273,959, Cl. 179-1.0SC.

Maruko, Morihisa: *See*—
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Maruyama, Eiichi: *See*—
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Marvin, Richard H.: *See*—
Dickhart, William W., III; and Marvin, Richard H., 4,273,498, Cl. 414-556.000.

Marx, Paul: *See*—
Jaeken, Jan; Verhecken, Andre; Vetter, Hans; and Marx, Paul, 4,273,855, Cl. 430-242.000.

Marzocchi, Alfred; Roberts, Michael G.; and Bolen, Charles E., to Owens-Corning Fiberglas Corporation. Asphalt compositions modified with organo silane compounds. 4,273,588, Cl. 106-273.00N.

Marzocchi, Alfred; Roberts, Michael G.; Bolen, Charles E.; and Harrington, Edward R., Jr., to Owens-Corning Fiberglas Corporation. Rubber modified asphalt compositions. 4,273,685, Cl. 260-28.50R.

Maschinenfabrik Augsburg-Nunberg Aktiengesellschaft: *See*—
Ambrosch, Friedrich; and Schwaebel, Rudolf, 4,273,510, Cl. 415-119.000.

Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See*—
Buddenhagen, Uwe, 4,273,079, Cl. 123-276.000.
Muller, Eckart, 4,273,291, Cl. 239-533.120.

Maschinenfabrik Hasenclever Gesellschaft mit beschrankter Haftung: *See*—
Endter, Horst, 4,272,981, Cl. 72-405.000.

Mastrangelo, Albert J., to SCM Corporation. Metal-joining paste and vehicle therefor. 4,273,593, Cl. 148-24.000.

Masucci, Pasquale; and Sommovigo, Paolo, to Centro Sperimentale Metallurgico S.p.A. Electrode height control in electro-slag remelting processes. 4,273,948, Cl. 13-9.0ES.

Masuko, Masami; and Ichikawa, Chikanobu, to Fujikoshi Machinery Corporation. Method of ultrasonic control for lapping and an apparatus therefor. 4,272,924, Cl. 51-165.00R.

Matsubara, Akira; Sakai, Hideaki; Odate, Makoto; and Nakano, Takuo, to Mitsui Toatsu Chemicals, Incorporated. 4-Hydroxy-5,6,7,8-tetrahydroquinoline-3-carboxylic acids and derivatives. 4,273,932, Cl. 546-156.000.

Matsuda, Akira; Yoshioka, Osamu; Takahashi, Katsutoshi; Yoshida, Kooichi; and Ninomiya, Hiroshi, to Nippon Kayaku Kabushiki Kaisha. Method of enhancing absorption of antitumor agent into gastrointestinal tumor site and orally administrable antitumor compositions therefor. 4,273,761, Cl. 424-81.000.

Matsuda, Kenji: *See*—
Sato, Mitsuhiro; Itatani, Hiroshi; and Matsuda, Kenji, 4,273,007, Cl. 74-745.000.

Matsuda, Mutsuhide; Tamamura, Hideo; Taguchi, Tetsuya; Okino, Tadashi; and Yazaki, Mutsunobu, to Canon Kabushiki Kaisha. Motor driven camera. 4,273,432, Cl. 354-145.000.

Matsui, Takeki: *See*—
Hayashi, Yoshio; Matsui, Takeki; Shiga, Tetsuo; Akashi, Kageyasu; Akiyama, Minoru; and Kimura, Takeo, 4,273,723, Cl. 260-414.000.

Matsumaru, Haruo: *See*—
Tsutsui, Ken; Sasano, Akira; Nakano, Toshio; Matsumaru, Haruo; and Maruyama, Eiichi, 4,273,812, Cl. 427-248.100.

Matsumoto, Kojiro: *See—*
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Matsumoto, Mutsumi; Sugi, Hideki; and Sudo, Atsushi, to Nippon Kayaku Kabushiki Kaisha. Process for producing methacrylic acid and a catalyst. 4,273,676, Cl. 252-435.000.

Matsuo, Mototsugu; and Otomine, Kazuo. Heat-transferrable applique. 4,273,817, Cl. 428-90.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Murata, Kosaku; Takayama, Satoshi; and Ieki, Mitsuru, 4,273,900, Cl. 525-444.000.
Noguchi, Satoshi, 4,274,094, Cl. 340-723.000.
Tomita, Masao, 4,274,117, Cl. 360-68.000.
Wada, Ryoichi; Senoo, Takanori; and Odagi, Kanji, 4,274,115, Cl. 360-62.000.

Matsuura, Hiroshi: *See—*
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Matsuyama, Kiyoshi: *See—*
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Matsuzaki, Mikio: *See—*
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Mattel, Inc.: *See—*
Buck, Gordon H.; and Amamoto, Kenneth I., 4,273,332, Cl. 273-86.00R.

Matthews, David R. Lighted address sign. 4,272,901, Cl. 40-574.000.

Matuo, Hirosi: *See—*
Tanaka, Nobuyasu; Nakajima, Kazuhira; Yamaguchi, Kaoru; Hara, Shinji; Murata, Morihiro; Nakazima, Tetuyosi; Matuo, Hirosi; Onishi, Akura; and Hirano, Kazuo, 4,273,253, Cl. 221-75.000.

Maurer, Friedhelm: *See—*
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Maurer, Herman J.; and Smith, Wayne G., to J. I. Case Company. Boom lock means. 4,273,502, Cl. 414-694.000.

Max Planck Gesellschaft zur Forderung der Wissenschaften e.V.: *See—*
Lubbers, Dietrich W., 4,273,442, Cl. 356-326.000.

Maxcy, Thomas A.; and Denny, John S., to General Mills, Inc. Preparation of dehydrated sugar treated beans. 4,273,796, Cl. 426-634.000.

Maxwell Laboratories, Inc.: *See—*
Harrison, John L., 4,274,046, Cl. 323-355.000.

Mazur, Robert H., to G. D. Searle & Co. N-Adamantane-substituted tetrapeptide amides. 4,273,704, Cl. 260-112.50R.

Mazziotti, Philip J.: *See—*
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McAleer, William J.; and Markus, Henry Z., to Merck & Co., Inc. Lyophilization process for live viral compositions. 4,273,762, Cl. 424-89.000.

McCollister, Howard L.; and Boling, Norman L., to Owens-Illinois, Inc. Process of making glass articles having antireflective coatings and product. 4,273,826, Cl. 428-304.000.

McComas, Charles C.; and Sokol, Larry S., to United Technologies Corporation. Ceramic faced structures and methods for manufacture thereof. 4,273,824, Cl. 428-256.000.

McCormick, Mathew, to Bowthorpe-Hellermann Limited. Synthetic plastics tie member. 4,272,870, Cl. 24-16.0PB.

McCoy, Terence D.: *See—*
Farr, Garth M.; McCoy, Terence D.; and Dlask, Jiri, 4,273,010, Cl. 81-57.180.

McCray, William R.: *See—*
Bisczat, John J.; Lisk, Robert R.; McCray, William R.; and Sizemore, James L., 4,273,456, Cl. 400-550.000.

McCusker, James D., to Engine Technology, Inc. Emergency marine propulsion using existing propeller shaft. 4,273,543, Cl. 440-4.000.

McDonald, Ray S.: *See—*
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McDonnell Douglas Corporation: *See—*
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Woodbury, James R., 4,273,006, Cl. 74-710.500.

McDonough, Everett G.: *See—*
Klemm, Ernest J.; Edman, Walter W.; Erskine, Frances E.; and McDonough, Everett G., 4,273,143, Cl. 132-7.000.

McGann, Timothy W.: *See—*
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McLaughlin, Donald W.: *See—*
Funderburk, Tim; and McLaughlin, Donald W., 4,274,155, Cl. 370-62.000.

McLaughlin, Hugh T., to Ameron, Inc. Insulated plastic pipe product and method. 4,273,161, Cl. 138-149.000.

McLennan, Richard E., to Satron, Inc. Cargo tie-down anchor. 4,273,487, Cl. 410-105.000.

McLoughlin, John; Rotblum, Yehuda; and Athanasiades, Neocles. Safety bar for fire trucks. 4,273,360, Cl. 280-751.000.

McMahon, John B., to Commonwealth Industrial Gases Limited, The. Safety device. 4,273,251, Cl. 220-361.000.

McNary, James F., to Global Marine, Inc. Connection of cold water riser pipes to supporting structures. 4,273,068, Cl. 114-264.000.

Mealing, Barrie E.; and Scott, Roderick A., to Hestair Eagle Limited. Refuse storage and discharge apparatus. 4,273,497, Cl. 414-517.000.

Meddaugh, Michael D., to Dow Corning Corporation. Method of providing waterproof coating for masonry walls. 4,273,813, Cl. 427-387.000.

Medtronic, Inc.: *See—*
Hartlaub, Jerome T.; Thompson, David L.; and McDonald, Ray S., 4,273,132, Cl. 128-419.0PT.
Hartlaub, Jerome T.; McDonald, Ray S.; and Rossing, Martin A., 4,273,133, Cl. 128-419.0PG.

Meenan, Cyril F. Multiple fuel burning system for furnaces or the like. 4,273,527, Cl. 431-177.000.

Megapulse Incorporated: *See—*
Johannessen, Paul R., 4,274,134, Cl. 363-59.000.

Mego Corp.: *See—*
Noble, Sidney, 4,272,915, Cl. 46-232.000.

Meinert, Leo L.: *See—*
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Meister, Michael L.: *See—*
Smith, Lloyd T.; Bartholomew, Alan E.; Fee, Robert W.; Meister, Michael L.; Robbins, Richard J.; and Ten Eyck, Richard E., 4,273,173, Cl. 81-177.00M.

Mendicino, Lyle J. Deglazing tool. 4,273,483, Cl. 409-178.000.

Menke, Josef F., to Electro-Optik GmbH & Co. K.G. Polygonal cylinder for use in optical picture scanning systems. 4,273,410, Cl. 350-6.200.

Menzel, Stanley W. O., to RIS Irrigation Systems. Conduit for drip irrigation systems. 4,273,286, Cl. 239-272.000.

Mercer, Stanley L. Aural pitch recognition teaching device. 4,273,023, Cl. 84-454.000.

Merck & Co., Inc.: *See—*
Christensen, Burton G.; Ratcliffe, Ronald W.; and Salzmann, Thomas N., 4,273,709, Cl. 260-239.00A.
Gal, George; and Pines, Seemon H., 4,273,943, Cl. 568-319.000.
Grier, Nathaniel; Dybas, Richard A.; and Witzel, Bruce E., 4,273,781, Cl. 424-267.000.
McAleer, William J.; and Markus, Henry Z., 4,273,762, Cl. 424-89.000.

Merger, Franz; and Foerster, Hans-Juergen, to BASF Aktiengesellschaft. Preparation of 3-hydroxy-2,2,4-trimethylpentyl isobutyrate. 4,273,934, Cl. 560-238.000.

Merger, Franz; Nestler, Gerhard; and Kempe, Uwe, to BASF Aktiengesellschaft. Preparation of N-substituted carboxylic acid amides. 4,273,938, Cl. 564-124.000.

Merges, Veit, to Messerschmitt-Bolkow-Blohm GmbH. Solar energy system. 4,273,101, Cl. 126-435.000.

Merrill, Stewart H.; Mutz, Alec N.; and Stahly, Frederick A., to Eastman Kodak Company. Method of using liquid electrographic developers containing polymeric quaternary salts. 4,273,849, Cl. 430-119.000.

Merz & Co.: *See—*
Scherm, Arthur, 4,273,774, Cl. 424-253.000.

Messerschmitt-Bolkow-Blohm GmbH: *See—*
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Sepp, Gunther; Born, Gunthard; and Malburg, Werner, 4,274,064, Cl. 331-94.50G.

Messirejean, Pierre: *See—*
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Metacon AG: *See—*
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Metako Kigyo Co., Ltd.: *See—*
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Metallgesellschaft Aktiengesellschaft: *See—*
Scheiber, Werner, 4,273,798, Cl. 427-27.000.

Methvin, James, to Enertek Energy Engineering Inc. Tracking solar energy collector. 4,273,107, Cl. 126-445.000.

Metzler, Richard B.: *See—*
D'Angelo, Paul F.; and Metzler, Richard B., 4,273,584, Cl. 106-3.000.

Meyer, Gunter: *See—*
Voegele, Gunther; and Meyer, Gunter, 4,273,263, Cl. 222-148.000.

Meyer, Paul M.; Beckwith, Robert H.; Allman, Richard D.; and Jefferis, Mark, to ACF Industries, Incorporated. Fuel control system development apparatus. 4,274,144, Cl. 364-551.000.

Micchelli, Albert L.: *See—*
Koehler, F. Theodore; Micchelli, Albert L.; and Nowak, Frank A., Jr., 4,273,760, Cl. 424-70.000.

Michigan Instruments, Inc.: *See—*
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MicroComm Corporation: *See—*
Hendricks, Donald B.; and Knight, Robert M., 4,274,145, Cl. 364-557.000.

Middeldorf, Martin, to DeMag Aktiengesellschaft. Roll stabilizing apparatus for vehicles. 4,273,348, Cl. 280-112.00A.

Middlebrook, Robert D.: *See—*
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Mighty-Mac, Inc.: *See—*
Bell, Richard S., 4,272,852, Cl. 2-94.000.

Miles Laboratories, Inc.: *See—*
Buckler, Robert T.; and Burd, John F., 4,273,715, Cl. 260-343.450.
Walter, Bert, 4,273,868, Cl. 435-14.000.
Miller, Barry: *See—*
Heller, Adam; Leamy, Harry J.; Miller, Barry; Nelson, Ronald J.; and Parkinson, Bruce A., 4,273,594, Cl. 148-33.300.
Miller, Larry A.: *See—*
Lowry, Robert K.; and Miller, Larry A., 4,272,986, Cl. 73-73.000.
Miller, Norman K. Elongate switch construction. 4,273,974, Cl. 200-61.430.
Minamino, Keiichi: *See—*
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Mineracoes Brasileiras Reunidas S.A.: *See—*
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Minnesota Mining and Manufacturing Company: *See—*
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Arco, Manuel J., 4,273,909, Cl. 528-45.000.
Harmer, Walter L., 4,273,912, Cl. 528-67.000.
Langer, Roger L.; Licht, Richard R.; and Marlor, Alan J., 4,273,879, Cl. 521-91.000.
Larimore, Franklin C.; and Heilmann, Steven M., 4,273,135, Cl. 128-640.000.
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Mishima Kosan Co., Ltd.: *See—*
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Mitchell, Ronald B.: *See—*
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Mitchell, Tyrone D.: *See—*
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Mitel Corporation: *See—*
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Mitsubishi Denki Kabushiki Kaisha: *See—*
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Kii, Masami, 4,273,977, Cl. 200-147.00R.
Ohdate, Mitsuo, 4,274,106, Cl. 357-79.000.
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Mitsubishi Paper Mills, Ltd.: *See—*
Kosaka, Takao; and Tahara, Yukio, 4,273,602, Cl. 156-234.000.
Nishiyama, Ryota; Koike, Takashi; and Seino, Shunji, 4,273,825, Cl. 428-223.000.
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Mitsubishi Rayon Co., Ltd.: *See—*
Kamada, Kazumasa; Kushi, Kenji; Yoshihara, Keisuke; and Nakamoto, Hideo, 4,273,799, Cl. 427-44.000.
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Mitsui Petrochemical Industries, Ltd.: *See—*
Hashimoto, Isao; Taguchi, Toru; and Nambu, Hirohiko, 4,273,623, Cl. 203-92.000.
Mitsui, Tetsuro: *See—*
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Mitsui Toatsu Chemicals, Incorporated: *See—*
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Mitsuoka Electric Mfg. Co., Ltd.: *See—*
Okagami, Kuni, 4,273,406, Cl. 339-147.00P.
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Miura, Heihachi: *See—*
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Miura, Tatsuo: *See—*
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Miyahara, Masayoshi; Katayama, Morimitsu; and Kisaka, Hiroyuki, to Kubota, Ltd. Gear transmission. 4,273,001, Cl. 74-359.000.
Miyamae, Ryuichi: *See—*
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Mizobe, Tugio: *See—*
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Mizzi, Joseph M. Topping cutter for a cane harvester. 4,272,947, Cl. 56-63.000.
Mo och Domsjo Aktiebolag: *See—*
Hillstrom, Per A. R.; and Norehall, Lars G., 4,273,612, Cl. 162-49.000.
Lofgren, Stig-Gunnar; and Ekeborg, Bo G., 4,273,056, Cl. 111-2.000.
Mobil Oil Corporation: *See—*
Audeh, Costandi A.; Heilweil, Israel J.; White, James R.; and Yan, Tsoung Y., 4,273,645, Cl. 208-323.000.
Braid, Milton; Horodysky, Andrew G.; and Kaminski, Joan M., 4,273,665, Cl. 252-49.600.
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Florian, John, 4,273,249, Cl. 220-4.00E.
Zarnegar, Bizhan M., 4,273,632, Cl. 204-159.150.
Moiroux, Auguste. Distribution system for the intake and exhaust of a super charged internal combustion engine. 4,273,083, Cl. 123-79.00R.
Moldenhauer, Hermann; and Muller, Kurt, to A. und K. Muller GmbH & Co. KG. Device for regulating the vacuum in a vacuum line system, especially for milking installations. 4,273,154, Cl. 137-490.000.
Molins, Limited: *See—*
Hinchcliffe, Dennis; Bennett, George R.; and Heybourn, Frank, 4,273,233, Cl. 198-347.000.
Molitorisz, Joseph. Bale forming apparatus. 4,273,034, Cl. 100-8.000.
Mollering, Hans; and Looser, Siegfried, to Boehringer Mannheim GmbH. Method and composition for the determination of glycerol. 4,273,870, Cl. 435-26.000.
Molnlycke AB: *See—*
Edling, Ernst G. S., 4,273,014, Cl. 83-333.000.
Molyneux-Berry, Robert B., to Marconi Company Limited, The. Power supply arrangements. 4,274,132, Cl. 363-21.000.
Mones, Arthur H.; Sartell, Jack A.; and Kardashian, Vahram S., to Honeywell Information Systems Inc. Method of forming solder bump terminals on semiconductor elements. 4,273,859, Cl. 430-315.000.
Monsanto Company: *See—*
Hirzy, John W., 4,273,890, Cl. 525-129.000.
Tolbert, William R.; Hitt, Mary M.; and Feder, Joseph, 4,273,871, Cl. 435-41.000.
Monsheimer, Rolf; and Pfleiderer, Ernst, to Rohm GmbH. Enzymatic bating method. 4,273,876, Cl. 435-265.000.
Moore, Glenn T. Shoe-tying training toy. 4,273,539, Cl. 434-260.000.
Morgan, Burton D., to Concept Development Institute, Inc. Solar heated building. 4,273,099, Cl. 126-426.000.
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Morris, Robert B.; and Kyllonen, Allen W., to American Standard Inc. Flexible mounting hub for disc member. 4,273,218, Cl. 188-18.00A.
Morrison, Bertram L., to ACF Industries, Incorporated. Valve mechanism incorporating universal seat spring. 4,273,309, Cl. 251-174.000.
Morrison, William M.; and Mazziotti, Philip J. Gear selector mechanism. 4,273,004, Cl. 74-473.00R.
Morton-Norwich Products, Inc.: *See—*
White, Ralph L., Jr.; and Portlock, David E., 4,273,927, Cl. 544-32.000.
Mosel, Edward F., to Superior Electric Company, The. Voltage commanded stepping motor control circuit. 4,274,041, Cl. 318-696.000.
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Gurtler, Richard W., 4,273,421, Cl. 350-353.000.
Marino, Joseph T., Jr., 4,274,085, Cl. 340-347.0DD.
Mouille, Rene L.; and Lafargue, Marcel A. S., to Societe Nationale Industrielle Aerospatiale. Main rotor for a helicopter. 4,273,511, Cl. 416-134.00A.

MPD Technology Corporation: *See—*
Rhoda, Richard N.; and Crosby, Jeffrey N., 4,273,755, Cl. 423-463.000.
MTU Motoren-und Turbinen-Union Munchen GmbH: *See—*
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Mucke, Rainer; Schiller, Johann; and Sackl, Herbert, to Hoechst Aktiengesellschaft. Thermoplastic composition comprising clorinated polyolefin and acrylate polymer. 4,273,894, Cl. 525-228.000.
Mueller, Ernest: *See—*
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Muller, Zdenek. Air brake safety mechanism. 4,273,388, Cl. 303-89.000.
Munz, Erich. Element for sonic and vibratory absorption. 4,273,213, Cl. 181-207.000.
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Murphy, John T., to R & M Associates, Inc. Method and apparatus for installing a dry bulk off-loading system. 4,273,477, Cl. 406-39.000.
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Muzyczko, Thaddeus M.; and Thomas, Daniel C., to Richardson Graphics Company. Method of coating using photopolymerizable latex systems. 4,273,851, Cl. 430-175.000.
Myers, Julius D.; and Russell, John X., to Babcock & Wilcox Company, The. Method of manufacturing a broaching tool. 4,272,927, Cl. 51-322.000.
Myers, Ronald W.; and Nardone, Daniel V., to AMP Incorporated. Transducer supporting and contacting means. 4,273,399, Cl. 339-17.00C.
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Nagai, Koji: *See—*
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Nagasawa, Kohtaro; Ochi, Hideo; Tanaka, Fujio; and Shibata, Yumi, to Somar Manufacturing Co., Ltd. Resist material for micro-fabrication with unsaturated dicarboxylic moiety. 4,273,858, Cl. 430-296.000.
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Nagati, Rashed N., to Pennsylvania Engineering Corporation. Metallurgical vessel suspension system. 4,273,316, Cl. 266-246.000.
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Nakai, Masaaki: *See—*
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Nall, Clive; Long, Leo E.; Rigby, Sterling C.; and Baugh, K. Boyd, to Major Sports Sales, Inc. Ski exercising apparatus. 4,273,327, Cl. 272-97.000.
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Nauroth, Peter; Esch, Heinz; Kuhlmann, Robert; Bode, Rudolf; Reisert, Arthur; Buhler, Harald; and Turk, Gunter, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Precipitated silicic acid, method and compositions containing same. 4,273,589, Cl. 106-308.00Q.
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Nazyrov, Ravil N.: *See—*
Pravoverov, Nikolai L.; Nazyrov, Ravil N.; Grigorov, Sergei S.; and Turova, Lidia S., 4,273,137, Cl. 128-784.000.
Neirynck, Albert; and Duflos, Roger, to Societe Francaise Duco. Process for the insulation of original paint layers. 4,273,808, Cl. 427-142.000.
Nelle, Gunther, to Dr. Johannes Heidenhain GmbH. Pivotable mount for scanning unit. 4,273,447, Cl. 356-373.000.
Nelson, Gary L.; and Harvey, William A., to Sperry Corporation. Rinse melt for LPE crystals. 4,273,609, Cl. 156-624.000.
Nelson, Norvell J., to Varian Associates, Inc. Elemental superselective gas chromatographic detection apparatus and method. 4,273,559, Cl. 23-232.00E.
Nelson, Ronald J.: *See—*
Heller, Adam; Leamy, Harry J.; Miller, Barry; Nelson, Ronald J.; and Parkinson, Bruce A., 4,273,594, Cl. 148-33.300.
Nersesian, Ara, to Bristol-Myers Company. Tertiary amine polyalkylene glycol esters, their addition salts and their quaternary ammonium compounds. 4,273,721, Cl. 260-404.000.
Nerurkar, Mohanlal S.; and Knowles, Peter G., to Imperial Chemical Industries Limited. Polyester films containing substantially spherical particles useful as slot liners. 4,274,025, Cl. 310-215.000.
Ness, Virginia V. Holder for rolls of paper. 4,273,299, Cl. 242-55.540.

Nestler, Gerhard: *See*—
Merger, Franz; Nestler, Gerhard; and Kempe, Uwe, 4,273,938, Cl. 564-124.000.
Nesvadba, Paul; and Weigl, Gisela, to W. C. Heraeus GmbH. Method for recovering rhodium. 4,273,578, Cl. 75-83.000.
Neuhaus, Gunter: *See*—
Blattermann, Karl-Gunther; Neuhaus, Gunter; and Nolte, Gunther, 4,273,238, Cl. 198-605.000.
Neuhauser, Hans G. Apparatus for drilling bone. 4,273,117, Cl. 128-92.00E.
Neula, Allen. Self-closing shower head. 4,273,292, Cl. 239-562.000.
Neumann, Jurgen, to Hoechst Aktiengesellschaft. Bearing plate for a band of photoconductive recording medium. 4,273,437, Cl. 355-3.0BE.
Nevin, Robert S., to Eli Lilly and Company. Polymerization process and product. 4,273,920, Cl. 528-361.000.
New Japan Chemical Company, Ltd.: *See*—
Tani, Shoji; and Nishio, Kenji, 4,273,719, Cl. 260-346.300.
Newkirk, David D.; and Login, Robert B., to BASF Wyandotte Corporation. Fiber lubricants derived from the oxyalkylation of a glycerol-1,3-dialkylether. 4,273,946, Cl. 568-625.000.
Newkirk, Franklin D.: *See*—
Koeneker, William V.; and Newkirk, Franklin D., 4,273,259, Cl. 222-108.000.
Nezworski, James E., to Perlick Company, Inc., The. In-line relief valve. 4,273,151, Cl. 137-115.000.
NGK Insulators, Ltd.: *See*—
Oda, Isao; Kaneno, Masayuki; and Hayakawa, Issei, 4,273,587, Cl. 106-73.400.
NGK Spark Plug Co., Ltd.: *See*—
Kazumi, Nakahara, 4,273,529, Cl. 431-255.000.
Shirai, Makoto; Ito, Michinobu; and Kato, Osamu, 4,273,480, Cl. 407-114.000.
Niagara Blower Company: *See*—
Kals, Walter, 4,273,733, Cl. 261-151.000.
Nicholson, Donald S.: *See*—
Renau, Jacques; Curtis, James W.; Nicholson, Donald S.; and Hennessey, Frank L., 4,274,098, Cl. 343-781.0CA.
Nickol, Stephen L.: *See*—
Kohn, Edward M.; Nickol, Stephen L.; and Thompson, Robert M., 4,273,898, Cl. 525-432.000.
Nicolaus, Frank G., to Bally Manufacturing Corporation. Gear train governors in spinning reel games. 4,273,333, Cl. 273-143.00R.
Nicolls, Ted. Interlocking building block. 4,272,940, Cl. 52-592.000.
Niemann, Eugene E.; and Niemann, Kelly E. Cooling system utilizing outside air. 4,272,966, Cl. 62-180.000.
Niemann, Kelly E.: *See*—
Niemann, Eugene E.; and Niemann, Kelly E., 4,272,966, Cl. 62-180.000.
Nilsson, Kenth: *See*—
Ekstrom, Olov; and Nilsson, Kenth, 4,273,366, Cl. 285-332.000.
Ninomiya, Hiroshi: *See*—
Matsuda, Akira; Yoshioka, Osamu; Takahashi, Katsutoshi; Yoshida, Kooichi; and Ninomiya, Hiroshi, 4,273,761, Cl. 424-81.000.
Nipak, Inc.: *See*—
Levens, Joseph A., 4,273,523, Cl. 425-326.100.
Nippon Electric Co., Ltd.: *See*—
Ito, Susumu; and Toki, Kaoru, 4,274,053, Cl. 324-174.000.
Saito, Yuji, 4,274,031, Cl. 313-407.000.
Nippon Kayaku Kabushiki Kaisha: *See*—
Matsuda, Akira; Yoshioka, Osamu; Takahashi, Katsutoshi; Yoshida, Kooichi; and Ninomiya, Hiroshi, 4,273,761, Cl. 424-81.000.
Matsumoto, Mutsumi; Sugi, Hideki; and Sudo, Atsushi, 4,273,676, Cl. 252-435.000.
Yamada, Yasushi; Ozawa, Hiroshi; Gomi, Masae; and Nomura, Hideshiro, 4,273,555, Cl. 8-673.000.
Nippon Kokan Kabushiki Kaisha: *See*—
Nomura, Hirokazu; Sato, Yukihiko; and Sato, Yoshikazu, 4,273,987, Cl. 219-124.340.
Nippon Oil Company Ltd.: *See*—
Kimura, Shoji; and Ishida, Noboru, 4,273,673, Cl. 252-396.000.
Nippon Soken, Inc.: *See*—
Takei, Toshihiro; Kuwakado, Satosi; Takakuwa, Eiji; and Shimogawa, Toshiaki, 4,273,361, Cl. 280-805.000.
Nippon Thompson, Co., Ltd.: *See*—
Takai, Takamoto, 4,273,389, Cl. 308-6.00C.
Nippondenso Co., Ltd.: *See*—
Sugie, Hiromichi; Akado, Hajime; and Yamashita, Akira, 4,273,564, Cl. 55-267.000.
Takeuchi, Keizo; Iwai, Yoshio; Yamanaka, Tadashi; and Miura, Tatsuo, 4,272,877, Cl. 29-403.200.
Nischwitz, Ehrenfried, to Hoechst Aktiengesellschaft. Process for the pretreatment of cellulose fibers to be printed according to the thermotransfer printing method. 4,273,552, Cl. 8-471.000.
Nishi, Tadaaki: *See*—
Kawamura, Masao; Nishi, Tadaaki; Kato, Kunioki; Mizokami, Hiroshi; and Kanazawa, Tadashi, 4,273,941, Cl. 564-416.000.
Nishikawa, Masaji, to Olympus Optical Co., Ltd. Electrostatographic printing method and apparatus. 4,273,438, Cl. 355-14.0CU.
Nishio, Kenji: *See*—
Tani, Shoji; and Nishio, Kenji, 4,273,719, Cl. 260-346.300.
Nishiyama, Ryota; Koike, Takashi; and Seino, Shunji, to Mitsubishi Paper Mills, Ltd. Electric insulating sheet. 4,273,825, Cl. 428-223.000.
Nishizawa, Masahiro: *See*—
Nonogaki, Saburo; Morishita, Hajime; Hashimoto, Michiaki; Manabe, Toshikatsu; Tomita, Yoshifumi; and Nishizawa, Masahiro, 4,273,842, Cl. 430-25.000.
Niskanen, Toivo, to A. Ahlstrom Osakeyhtio. Method and apparatus for pumping gaseous liquids and separating the gaseous components therefrom. 4,273,562, Cl. 55-52.000.
Nissan Chemical Industries Ltd.: *See*—
Endo, Makoto; and Kusahara, Kohji, 4,273,754, Cl. 423-385.000.
Nissan Motor Company, Limited: *See*—
Isobe, Takayuki; and Matsuzaki, Mikio, 4,274,078, Cl. 340-98.000.
Iwanaga, Kazuyoshi; Sugano, Kazuhiko; and Ohtsuka, Kunio, 4,273,009, Cl. 74-869.000.
Shimatake, Hirokazu; Natsume, Kenzo; Kojima, Takeshi; Ogawa, Shuichi; Nara, Ryuichi; Uchida, Shigeru; and Takagishi, Haruyoshi, 4,273,504, Cl. 414-728.000.
Ueno, Mitsuo, 4,273,460, Cl. 403-1.000.
Yamane, Ken, 4,272,959, Cl. 60-602.000.
Nissen, Axel: *See*—
Heilen, Gerd; Nissen, Axel; Koernig, Wolfgang; Horner, Michael; Fliege, Werner; and Boettger, Guenter, 4,273,945, Cl. 568-420.000.
Nitzbon, Karl-Heinz, to Autoflug GmbH. Roller unit for winding-up safety belts for motor vehicles. 4,273,210, Cl. 180-268.000.
Nixdorf Computer AG: *See*—
Haftmann, Johannes, 4,273,453, Cl. 400-196.100.
NL Industries, Inc.: *See*—
Kolakowski, Michael A., 4,273,746, Cl. 423-92.000.
Noble, Sidney, to Mego Corp. Audio-visual amusement device. 4,272,915, Cl. 46-232.000.
Noda, Atsushi, to Canon Kabushiki Kaisha. Recording device for use with recording media of various widths. 4,273,457, Cl. 400-705.100.
Noguchi, Kenzo: *See*—
Shima, Ichiji; Yamamoto, Tatsuo; Yoshibayashi, Shigeru; Teshima, Hiroshi; Hizume, Akio; Iki, Tetsuo; Yamamoto, Takashi; Kanamori, Kyozo; and Noguchi, Kenzo, 4,272,992, Cl. 73-650.000.
Noguchi, Satoshi, to Matsushita Electric Industrial Co., Ltd. Cathode-ray tube display apparatus. 4,274,094, Cl. 340-723.000.
Nolan, Lily P. Filing case having removable, expanding file. 4,273,397, Cl. 312-237.000.
Noland, James S.; and Hajek, Miroslav, to American Cyanamid Company. Epoxy based synthetic solder. 4,273,686, Cl. 260-9.000.
Nolte, Gunther: *See*—
Blattermann, Karl-Gunther; Neuhaus, Gunter; and Nolte, Gunther, 4,273,238, Cl. 198-605.000.
Noma Lites Canada Limited: *See*—
Koehler, Rudolph A., 4,273,814, Cl. 428-8.000.
Nomm, Matt: *See*—
Dorr, John A.; and Nomm, Matt, 4,273,212, Cl. 181-102.000.
Nomura, Hideshiro: *See*—
Yamada, Yasushi; Ozawa, Hiroshi; Gomi, Masae; and Nomura, Hideshiro, 4,273,555, Cl. 8-673.000.
Nomura, Hirokazu; Sato, Yukihiko; and Sato, Yoshikazu, to Nippon Kokan Kabushiki Kaisha. Method of controlling synchronized movement of backing shoe in automatic one-side welding. 4,273,987, Cl. 219-124.340.
Nomura, Nobutaka; Kido, Hiroshi; and Yamada, Kazunari, to Hitachi, Ltd. Data input apparatus. 4,274,081, Cl. 340-153.000.
Nonnenmann, Manfred, to Suddeutsche Kuhlerfabrik Julius Fr. Behr GmbH & Co. KG. Support matrix for a catalytic reactor for scrubbing exhaust gases in an internal combustion engine. 4,273,681, Cl. 252-472.000.
Nonogaki, Saburo; Morishita, Hajime; Hashimoto, Michiaki; Manabe, Toshikatsu; Tomita, Yoshifumi; and Nishizawa, Masahiro, to Hitachi, Ltd. Process for forming patternwise coated powder layer. 4,273,842, Cl. 430-25.000.
Nopper, Herbert, to Casimir Kast GmbH & Co. K.G. Apparatus for heating a fleece. 4,273,981, Cl. 219-10.49R.
Nordic Finance and Trade (Panama) Ltd. Inc.: *See*—
Vandame, Philippe L., 4,273,975, Cl. 200-67.00C.
Nordson Corporation: *See*—
Hastings, Donald R., 4,273,293, Cl. 239-705.000.
Norehall, Lars G.: *See*—
Hillstrom, Per A. R.; and Norehall, Lars G., 4,273,612, Cl. 162-49.000.
Norfin, Inc.: *See*—
Snellman, Donald L.; and Gerbracht, Osceola J., 4,273,326, Cl. 271-288.000.
Norris, Philip R., to Polaroid Corporation. Two-bladed shutter mechanism for microfiche camera. 4,273,433, Cl. 354-246.000.
Northern Telecom Limited: *See*—
Garner, John N.; and Hayes, Arthur S., 4,273,597, Cl. 156-48.000.
Northrop Corporation: *See*—
Spiegel, Leo, 4,274,040, Cl. 318-689.000.
Norvell, Gordon S.; and King, Donald W., to Litton Systems, Inc. Glass-or ceramic-to-metal seals. 4,273,282, Cl. 228-116.000.
Nosowicz, Eugene J.: *See*—
Carter, Eric L.; and Nosowicz, Eugene J., 4,274,017, Cl. 307-289.000.
Noto, Kunihiro: *See*—
Fukasaku, Yoshinori; and Noto, Kunihiro, 4,274,036, Cl. 318-331.000.

Notta, Adolf; and Scovell, Ian A., to Wetrok, Inc. Carpet cleaning device. 4,272,861, Cl. 15-320.000.

Novikov, Alexei V.: *See—*
Tertishnikov, Anatoly S.; Platunov, Boris P.; Novikov, Alexei V.; Gordeev, Nikolai A.; Belebashev, Eduard K.; Lovtsov, Dmitry P.; Korytov, Vladimir A.; and Ignatiev, Jury P., 4,273,180, Cl. 164-49.000.

Novotny, Miroslav, to Allied Chemical Corporation. Hydrogenation of fluorine-containing carboxylic acids. 4,273,947, Cl. 568-842.000.

Nowak, Frank A., Jr.: *See—*
Koehler, F. Theodore; Micchelli, Albert L.; and Nowak, Frank A., Jr., 4,273,760, Cl. 424-70.000.

Nuckolls, Joe A., to General Electric Company. High-frequency lamp operating circuit. 4,274,033, Cl. 315-209.00R.

Numata, Tatsuo: *See—*
Ishida, Kohji; and Numata, Tatsuo, 4,274,057, Cl. 329-167.000.

Nybakken, George H., to Uniroyal, Inc. Pneumatic radial tire with folded ply breaker having soft cushion surrounding breaker edge. 4,273,177, Cl. 152-360.000.

Obidina, Valentina F.: *See—*
Dodonov, Jury I.; and Obidina, Valentina F., 4,274,032, Cl. 315-39.510.

Obrist, Albert. Process and apparatus for the production of a guarantee closure. 4,272,945, Cl. 53-557.000.

Occidental Petroleum Corporation: *See—*
Wahl, Edward F., III, 4,272,960, Cl. 60-641.00D.

Occidental Research Corporation: *See—*
Sadhukhan, Pasupati, 4,272,961, Cl. 60-641.00D.

Ochi, Hideo: *See—*
Nagasawa, Kohtaro; Ochi, Hideo; Tanaka, Fujio; and Shibata, Yumi, 4,273,858, Cl. 430-296.000.

Oda, Isao; Kaneno, Masayuki; and Hayakawa, Issei, to NGK Insulators, Ltd. Polycrystalline transparent spinel sintered body and a method for producing the same. 4,273,587, Cl. 106-73.400.

Odagi, Kanji: *See—*
Wada, Ryoichi; Senoo, Takanori; and Odagi, Kanji, 4,274,115, Cl. 360-62.000.

Odate, Makoto: *See—*
Matsubara, Akira; Sakai, Hideaki; Odate, Makoto; and Nakano, Takuo, 4,273,932, Cl. 546-156.000.

Oesterlin, Rudolf: *See—*
Beil, Malcolm R.; and Oesterlin, Rudolf, 4,273,713, Cl. 260-326.620.

Ogasawara, Hiroomi; and Ogasawara, Masaomi. Face gear assembly. 4,273,002, Cl. 74-462.000.

Ogasawara, Masaomi: *See—*
Ogasawara, Hiroomi; and Ogasawara, Masaomi, 4,273,002, Cl. 74-462.000.

Ogawa, Kiyoshi: *See—*
Suhara, Yasuji; Ogawa, Kiyoshi; Yokose, Kazuteru; and Watanabe, Kimihiro, 4,273,765, Cl. 424-180.000.

Ogawa, Masahiro; and Mizobe, Tugio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method of resistance welding. 4,273,983, Cl. 219-93.000.

Ogawa, Shuichi: *See—*
Shimatake, Hirokazu; Natsume, Kenzo; Kojima, Takeshi; Ogawa, Shuichi; Nara, Ryuichi; Uchida, Shigeru; and Takagishi, Haruyoshi, 4,273,504, Cl. 414-728.000.

Ogawa, Takahisa: *See—*
Nagashima, Tetsuya; Usuba, Yasunori; Ogawa, Takahisa; and Takehara, Masahiro, 4,273,684, Cl. 252-544.000.

Ohba, Shinya; Tanaka, Shuhei; Kubo, Masaharu; Ando, Haruhisa; Yamashita, Yataro; Hanamura, Shoji; Aoki, Masakazu; and Nakai, Masaaki, to Hitachi, Ltd. Solid-state imaging device. 4,274,113, Cl. 358-212.000.

Ohdate, Mitsuo, to Mitsubishi Denki Kabushiki Kaisha. Explosion proof vibration resistant flat package semiconductor device. 4,274,106, Cl. 357-79.000.

Ohno, Hideshi: *See—*
Kume, Kazunari; Watanabe, Minoru; Ohno, Hideshi; and Tamaru, Munetaka, 4,274,153, Cl. 368-80.000.

Ohno, Shigeru; Tezuka, Haruya; and Ishihara, Toshinobu, to Shin-Etsu Chemical Co., Ltd. Method for selective preparation of cis isomers of ethylenically unsaturated compounds. 4,273,944, Cl. 568-396.000.

Ohno, Yasuya: *See—*
Teragaki, Takeshi; Ohno, Yasuya; and Yokoyama, Etsuso, 4,273,396, Cl. 312-223.000.

Ohtsuka, Kunio: *See—*
Iwanaga, Kazuyoshi; Sugano, Kazuhiko; and Ohtsuka, Kunio, 4,273,009, Cl. 74-869.000.

Okabe, Yasuhisa, to Victor Company of Japan, Limited. Single ended push-pull amplifier. 4,274,059, Cl. 330-266.000.

Okada, Fumio: *See—*
Takamizawa, Minoru; Okada, Fumio; Hara, Yasuaki; and Aoki, Hisashi, 4,273,907, Cl. 528-29.000.

Okagami, Kuni, to Mitsuoka Electric Mfg. Co., Ltd. Electrical cord adapter. 4,273,406, Cl. 339-147.00P.

Okamoto, Joji; Azuma, Hitoshi; Arai, Katsushi; Naito, Takemi; Kawai, Seiji; and Goto, Minoru, to Hitachi, Ltd. Method of applying slip to interior surfaces of a closed tank to provide an enamel coating. 4,273,811, Cl. 427-232.000.

Okawara, Tomokichi: *See—*
Kamiya, Hiroyuki; Watanabe, Seiji; Taniguchi, Masatosi; Okawara, Tomokichi; Aki, Fumitake; and Wachi, Yasuyuki, 4,274,021, Cl. 310-54.000.

Okino, Tadashi: *See—*
Matsuda, Mutsuhide; Tamamura, Hideo; Taguchi, Tetsuya; Okino, Tadashi; and Yazaki, Mutsunobu, 4,273,432, Cl. 354-145.000.

Okuda, Takio: *See—*
Hara, Katsunori; Baba, Toshihiko; and Okuda, Takio, 4,273,984, Cl. 219-97.000.

Okugawa, Michihide; and Ishii, Ryougi, to Dainichi-Nippon Cables, Ltd. Process for treating liquid containing Au-CN compound. 4,273,579, Cl. 75-106.000.

Okuzawa, Tugio: *See—*
Kaneko, Tamaki; Mizuma, Kenich; and Okuzawa, Tugio, 4,273,323, Cl. 271-157.000.

Oldham, Walter, to Beaufort Air-Sea Equipment Ltd. Lifejacket. 4,272,857, Cl. 9-345.000.

Olin Corporation: *See—*
Patel, Harshad M., 4,273,736, Cl. 264-45.300.
Raynor, Robert J., 4,273,882, Cl. 521-110.000.
Specht, Steven J., 4,273,630, Cl. 204-98.000.

Oliver Industries, Inc.: *See—*
Storm, Manfred, 4,273,278, Cl. 224-321.000.

Olney, Robert S., to Atlas Powder Company. Transportation and placement of water-in-oil explosive emulsions. 4,273,147, Cl. 137-13.000.

Olofsson, Olof: *See—*
Kjellstrand, Gunnar M. T.; Olofsson, Olof; and Linder, Anders G., 4,273,461, Cl. 403-125.000.

Olsen, C. Eric, to Auburn Enterprises, Inc. Surgical stylet. 4,273,131, Cl. 128-341.000.

Olson, James E.: *See—*
Hanson, Sheldon H.; Thompson, Craig B.; and Olson, James E., 4,273,791, Cl. 426-439.000.

Olson, Robert A.: *See—*
Garscadden, Alan; Bletzinger, Peter; Hasinger, Siegfried H.; Olson, Robert A.; and Sarka, Benjamin, 4,274,065, Cl. 331-94.50G.

Olson, Robert K.: *See—*
Paduch, Stanley R.; and Olson, Robert K., 4,273,150, Cl. 137-85.000.

Olympus Optical Co., Ltd.: *See—*
Ida, Masatoshi, 4,274,116, Cl. 360-65.000.
Maitani, Yoshihisa; and Sato, Yuichi, 4,273,434, Cl. 354-288.000.
Nishikawa, Masaji, 4,273,438, Cl. 355-14.0CU.
Tsukaya, Takashi, 4,273,111, Cl. 128-6.000.

Omark Industries, Inc.: *See—*
Scott, Lewis A.; and Gibson, Duane M., 4,272,889, Cl. 30-371.000.

Omnicomp, Inc.: *See—*
Rose, Stanley E., 4,272,892, Cl. 33-185.00R.

Onaka, Hidemi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas recirculation system with engine load dependent performance. 4,273,092, Cl. 123-568.000.

Onishi, Akura: *See—*
Tanaka, Nobuyasu; Nakajima, Kazuhira; Yamaguchi, Kaoru; Hara, Shinji; Murata, Morihiro; Nakazima, Tetuyosi; Matuo, Hirosi; Onishi, Akura; and Hirano, Kazuo, 4,273,253, Cl. 221-75.000.

Onizawa, Masao, to Sanyo Trading Co., Ltd. Vulcanizable rubber compositions with amino acids. 4,273,897, Cl. 525-351.000.

Onodera, Toshio; and Tanimura, Ken, to Sony Corporation. Bobbin structure for high voltage transformers. 4,274,136, Cl. 363-68.000.

Orain, Michel A., to Glaenzer Spicer. Power transmitting device and applications thereof. 4,273,209, Cl. 180-254.000.

Orenstein, Henry. Rocket car. 4,272,914, Cl. 46-209.000.

Orr, Wallace H., to General Electric Company. Terminal block assembly. 4,273,408, Cl. 339-198.00G.

Osaka Gas Kabushiki Kaisha: *See—*
Tanaka, Shunroku; Inoue, Jun; Yukimachi, Katsurou; and Minamino, Keiichi, 4,273,184, Cl. 165-59.000.

Oscar Mayer & Co. Inc.: *See—*
Gifford, Maurice J.; Seiferth, Oscar E.; and Grindrod, Paul E., 4,273,815, Cl. 428-35.000.

Osther, Kurt B.; and Jensen, Werner K., to Ess-Food Eksport-Svineslagteriernes Salgsforening. Interferon product and process for its preparation. 4,273,703, Cl. 260-112.00R.

Oswell, Hugh H. B., to Submarine Products Limited. Underwater breathing apparatus. 4,273,120, Cl. 128-204.260.

Otis Engineering Corporation: *See—*
Pearce, Joseph L.; Yonker, John H.; and Deaton, Thomas M., 4,273,186, Cl. 166-72.000.

Otomine, Kazuo: *See—*
Matsuo, Mototsugu; and Otomine, Kazuo, 4,273,817, Cl. 428-90.000.

Ott, Arthur W.: *See—*
Smith, James D. B.; and Ott, Arthur W., 4,273,914, Cl. 528-89.000.

Otten, Jay G., to BASF Wyandotte Corporation. Organo-phosphorus flame-retardant for polyurethane foams prepared from graft polyoxyalkylene polyether polyols. 4,273,881, Cl. 521-108.000.

Outokumpu Oy: *See—*
Seilo, Matti, 4,273,642, Cl. 204-286.000.

Overall, Kenneth D. Newspaper dispenser. 4,273,255, Cl. 221-213.000.

Owens-Corning Fiberglas Corporation: *See—*
Butt, Frederick A., 4,273,599, Cl. 156-172.000.
Marzocchi, Alfred; Roberts, Michael G.; and Bolen, Charles E., 4,273,588, Cl. 106-273.00N.
Marzocchi, Alfred; Roberts, Michael G.; Bolen, Charles E.; and Harrington, Edward R., Jr., 4,273,685, Cl. 260-28.50R.

Owens-Illinois, Inc.: *See—*
Bates, Edson C.; and King, Jeanne A., 4,273,012, Cl. 83-17.000.

McCollister, Howard L.; and Boling, Norman L., 4,273,826, Cl. 428-304.000.

Ozawa, Hiroshi: *See—*
Yamada, Yasushi; Ozawa, Hiroshi; Gomi, Masae; and Nomura, Hideshiro, 4,273,555, Cl. 8-673.000.

Ozawa, Masayuki, to Mitsubishi Denki Kabushiki Kaisha. Non-contactor ignition system for internal combustion engines. 4,273,093, Cl. 123-653.000.

Ozbey, Ahmet M.: *See—*
Ozbey, Suzan N.; Ozbey, Amber L.; and Ozbey, Ahmet M., 4,273,328, Cl. 272-137.000.

Ozbey, Amber L.: *See—*
Ozbey, Suzan N.; Ozbey, Amber L.; and Ozbey, Ahmet M., 4,273,328, Cl. 272-137.000.

Ozbey, Suzan N.; Ozbey, Amber L.; and Ozbey, Ahmet M. Chest muscle and posture developer. 4,273,328, Cl. 272-137.000.

Paciotti, Joseph D.: *See—*
Conageski, Raymond H.; and Paciotti, Joseph D., 4,273,657, Cl. 210-703.000.

Packaging Industries, Inc.: *See—*
Gundal, Peter H.; and Briggs, Richard, 4,273,230, Cl. 192-150.000.

Padgett, Clarence W.; Marmet, Melvin L.; and Tennyson, Mark R., to Rockwell International Corporation. Static read only memory. 4,274,147, Cl. 365-189.000.

Paduch, Stanley R.; and Olson, Robert K., to United Technologies Corporation. Leverless pressure transducer. 4,273,150, Cl. 137-85.000.

Page, John K. R.: *See—*
Kent, Peter J. C.; and Page, John K. R., 4,273,667, Cl. 252-70.000.

Pagel, LaVerne L.: *See—*
Frosch, Robert A.; Lawing, Pierce L.; and Pagel, LaVerne L., 4,273,304, Cl. 244-117.00A.

Pai, Damodar M.; Turner, S. Richard; Yanus, John F.; Renfer, Dale S.; and Stolka, Milan, to Xerox Corporation. Imaging member having a charge transport layer of a terphenyl diamine and a polycarbonate resin. 4,273,846, Cl. 430-59.000.

Palletron Incorporated: *See—*
James, Raymond E., 4,273,490, Cl. 414-95.000.

Pannell Manufacturing Corporation: *See—*
Pannell, Robert T., 4,273,495, Cl. 414-272.000.

Pannell, Robert T., to Pannell Manufacturing Corporation. Apparatus and method for laying compost in a mushroom bed. 4,273,495, Cl. 414-272.000.

Panzer, Klaus: *See—*
Leysieffer, Hans; and Panzer, Klaus, 4,274,112, Cl. 358-181.000.

Papalexis, Gregory C. Device for depanning freshly baked pizza or other baked goods. 4,273,496, Cl. 414-417.000.

Paradyne Corporation: *See—*
Armstrong, Thomas R., 4,273,955, Cl. 178-69.00G.

Parker, Alonzo E., Jr. Shackling apparatus for live poultry. 4,272,863, Cl. 17-44.100.

Parker, George, Sr. Submerged hydroelectric power generation. 4,274,009, Cl. 290-43.000.

Parker-Hannifin Corporation: *See—*
Lowles, David C., 4,273,160, Cl. 138-124.000.

Parkinson, Bruce A.: *See—*
Heller, Adam; Leamy, Harry J.; Miller, Barry; Nelson, Ronald J.; and Parkinson, Bruce A., 4,273,594, Cl. 148-33.300.

Parklawn Associates, Inc.: *See—*
Thoms, Richard W., 4,272,965, Cl. 62-104.000.

Parsch, Claus P.; and Gibson, John P., to Siemens Aktiengesellschaft. Synchronous linear motor. 4,274,020, Cl. 310-13.000.

Pashkow, William B., to Sheller-Globe Corporation. Vehicle suspension system. 4,273,357, Cl. 280-697.000.

Pashley, Richard D., to Intel Corporation. MOS/SOS Process. 4,272,880, Cl. 29-571.000.

Patel, Harshad M., to Olin Corporation. Method for preparing packing for a sodium-mercury amalgam decomposer reactor. 4,273,736, Cl. 264-45.300.

Paton, Boris E.; Scherbina, Boris E.; Lebedev, Vladimir K.; Ivantsov, Oleg M.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; Galian, Boris A.; Unigovsky, Mikhail R.; and Serafin, Orest M. Internal resistance pipe butt welder. 4,273,985, Cl. 219-101.000.

Patriquin, George P., to Hudson Lock, Inc. Cylinder lock with key removable core. 4,272,975, Cl. 70-369.000.

Paul, William A. Apparatus for applying gasket-forming material. 4,273,607, Cl. 156-540.000.

Paul Wurth, S.A.: *See—*
Legille, Edouard; and Mailliet, Pierre, 4,273,492, Cl. 414-160.000.

Pauli, Klaus H., to Deere & Company. Discharge arrangement for an axial flow rotary separator. 4,273,138, Cl. 130-27.00T.

Pavincic, Ivan. Sailing vessel. 4,273,060, Cl. 114-39.000.

Pearce, Joseph L.; Yonker, John H.; and Deaton, Thomas M., to Otis Engineering Corporation. Well safety valve system. 4,273,186, Cl. 166-72.000.

Pedlow, J. Watson. Fire protective tape. 4,273,821, Cl. 428-215.000.

Pedrazzi, Reinhard, to Sandoz Ltd. Monoazo and disazo dyes containing at least one sulfo group and at least two basic or cationic groups. 4,273,707, Cl. 260-187.000.

Peerless Electronics Research Corp.: *See—*
Schmid, Carl J., 4,273,449, Cl. 356-411.000.

Pehrsson, Anders L., to Aktiebolaget Karlstads Mekaniska Werkstad. Marine propeller unit. 4,273,545, Cl. 440-75.000.

Pelagalli, Domenico: *See—*
Garzia, Aldo; Vittadini, Giorgio; Bottazzi, Andrea; Pelagalli, Domenico; and Coccoli, Costantino, 4,273,931, Cl. 546-344.000.

Pennsylvania Engineering Corporation: *See—*
Nagati, Rashed N., 4,273,316, Cl. 266-246.000.

Pepe, Enrico J.; and Marsden, James G., to Union Carbide Corporation. Certain acid salts of polyester aminoorganosilanes. 4,273,694, Cl. 260-29.20E.

Pepi, Jerome S.: *See—*
Fischer, Michael A.; and Pepi, Jerome S., 4,273,195, Cl. 169-39.000.

Pere, Gerard, to Creusot-Loire. Improvements in electrolyzers. 4,273,641, Cl. 204-253.000.

Perkey, Conrad G.: *See—*
Winterhalter, Donald L.; and Perkey, Conrad G., 4,273,182, Cl. 164-137.000.

Perkins, Neale A., to Safariland Ltd. Inc. Holster with adjustable safety strap. 4,273,276, Cl. 224-243.000.

Perlick Company, Inc., The: *See—*
Nezworski, James E., 4,273,151, Cl. 137-115.000.

Pernet, Jean P.: *See—*
Fadda, Jean; and Pernet, Jean P., 4,273,563, Cl. 55-189.000.

Peronnet, Roland; Couturier, Bernard; and Fombert, Christian, to La Societe Pyral. Process for transfer of a magnetic layer from a temporary to a permanent support. 4,273,603, Cl. 156-236.000.

Perreault, Aime J., to Champlain Cable Corporation. Insulation system for wire and cable. 4,273,829, Cl. 428-383.000.

Perrelli, Nicholas J. Automatic damper control. 4,273,526, Cl. 431-20.000.

Perry, Forbes G. D., to National Research Development Corporation. Fluid pressure operated actuator. 4,272,999, Cl. 74-200.000.

Personal Products Company: *See—*
Kraskin, Kenneth S., 4,273,786, Cl. 424-319.000.

Pezzana, Francesco; and Quacquarella, Cesare, to W. R. Grace & Co. Process for making multi-walled plastic bag. 4,273,549, Cl. 493-196.000.

Pfarre, Edgar L., to Bell Telephone Laboratories, Incorporated. Three-phase ferroresonant transformer structure embodied in one unitary transformer construction. 4,274,071, Cl. 336-12.000.

Pfarrwaller, Erwin, to Sulzer Brothers Limited. Fabric take-off device. 4,273,163, Cl. 139-308.000.

Pfister, Johann K.: *See—*
Borgeaud, Gaston; and Pfister, Johann K., 4,273,055, Cl. 105-199.00F.

Pfizer Inc.: *See—*
Cross, Peter E.; and Dickinson, Roger P., 4,273,782, Cl. 424-273.00R.
Sarges, Reinhard, 4,273,775, Cl. 424-256.000.

Pfleiderer, Ernst: *See—*
Monsheimer, Rolf; and Pfleiderer, Ernst, 4,273,876, Cl. 435-265.000.

Pfundstein, Wolfgang: *See—*
Beeskow, Bruno; Bauer, Egon; and Pfundstein, Wolfgang, 4,273,030, Cl. 91-450.000.

Philipp, Helmut, to Jagenberg Werke Aktiengesellschaft. Suction braking apparatus. 4,273,324, Cl. 271-183.000.

Phillips, David C.; Hickam, William M.; and Smith, James D. B., to Westinghouse Electric Corp. Multiple signal thermoparticulating coating. 4,272,988, Cl. 73-339.00R.

Phillips, Paul S.; and Forsythe, Glenn, to Woodings Industrial Corporation. Drilling bit for blast furnace tap holes. 4,273,202, Cl. 175-385.000.

Phillips Petroleum Company: *See—*
Angel, Richard R., 4,273,363, Cl. 285-47.000.
Johnson, Neal W., 4,273,146, Cl. 137-5.000.
Reed, Edwin E., 4,272,994, Cl. 73-807.000.

Phillips, William R., Jr.; Tate, Ronald D.; and Tolman, Radon, to Dravo Corporation. Method of process off-gas control. 4,273,312, Cl. 266-44.000.

Phipps, Joe; Thurber, Robert E.; and Prengaman, Richard J., to United States of America, Navy. Radar video converter. 4,274,095, Cl. 343-7.00A.

Photowatt International, Inc.: *See—*
Chitre, Sanjiv R., 4,273,950, Cl. 136-255.000.

Piatt, Ralph L.: *See—*
Wigby, Jon; Piatt, Ralph L.; and Anderson, James D., 4,272,879, Cl. 29-566.200.

Piazza, Andre L.; Krenek, Michael J.; and Ames, Thomas J., to FMC Corporation. Apparatus for protecting subsea wells. 4,273,472, Cl. 405-211.000.

Pielkenrood, Jacob, to Pielkenrood-Vinitex B.V. Separation device. 4,273,654, Cl. 210-232.000.

Pielkenrood-Vinitex B.V.: *See—*
Pielkenrood, Jacob, 4,273,654, Cl. 210-232.000.

Pierpoint, William, to United States of America, Navy. Equi-visibility lighting control system. 4,273,999, Cl. 250-205.000.

Pierson, Don H.; and Pierson, Robert D. Portable alarm system. 4,274,088, Cl. 340-568.000.

Pierson, Mark V.: *See—*
Foley, Michael S.; and Pierson, Mark V., 4,273,393, Cl. 312-97.100.

Pierson, Robert D.: *See—*
Pierson, Don H.; and Pierson, Robert D., 4,274,088, Cl. 340-568.000.

Piesch, Steffen; Dorries, Peter; Schmidt, Ewald; and Hensel, Richard, to Cassella Aktiengesellschaft. Latent curing agent for thermosetting aminoplast resins, its manufacture and its use. 4,273,669, Cl. 252-182.000.

Pilznienski, John F.: *See—*
Wood, William G.; and Pilznienski, John F., 4,273,591, Cl. 134-11.000.

Pindar, John F.; Cohen, Jerome M.; and Bryant, Charles P., to Lubrizol Corporation, The. Hydrocarbon-substituted methylol phenols. 4,273,891, Cl. 525-145.000.

Pines, Seemon H.: *See*—
Gal, George; and Pines, Seemon H., 4,273,943, Cl. 568-319.000.

Pioneer Electronic Corporation: *See*—
Hirata, Hitoshi, 4,273,958, Cl. 179-1.0GS.
Ishida, Kohji; and Numata, Tatsuo, 4,274,057, Cl. 329-167.000.
Kawanabe, Yoshihiro, 4,274,060, Cl. 330-295.000.

Pitts, Robert W., Jr.: *See*—
Arnold, Dan M.; and Pitts, Robert W., Jr., 4,272,982, Cl. 73-19.000.

Pizzedaz, Ronald D., to Mesta Machine Company. Hot strip rolling mill stand. 4,272,976, Cl. 72-45.000.

Plasta-Plug, Inc.: *See*—
Keeney, Gary E.; Zurcher, Allen K.; and Loomis, Ervin C., 4,273,367, Cl. 285-419.000.

Plattner, Jacob: *See*—
Voss, Houston F.; Plattner, Jacob; and Herrin, Thomas R., 4,273,866, Cl. 435-7.000.

Platunov, Boris P.: *See*—
Tertishnikov, Anatoly S.; Platunov, Boris P.; Novikov, Alexei V.; Gordeev, Nikolai A.; Belebashev, Eduard K.; Lovtsov, Dmitry P.; Korytov, Vladimir A.; and Ignatiev, Jury P., 4,273,180, Cl. 164-49.000.

Pluequet, Heinz, to Klockner-Humboldt-Deutz Aktiengesellschaft. Exhaust gas conduit system for multi-cylinder reciprocating piston internal combustion engines. 4,273,080, Cl. 123-41.500.

Poag, Mary K. Combination valise and backrest. 4,273,221, Cl. 190-8.000.

Poehlmann, Paul W. Pivoting blade knife. 4,272,887, Cl. 30-161.000.

Pohle, Richard H., to United States of America, Air Force. Light spot position sensor for a wavefront sampling system. 4,273,446, Cl. 356-354.000.

Poisson, Regis: *See*—
Jacques, Roland; and Poisson, Regis, 4,273,735, Cl. 264-5.000.

Polaroid Corporation: *See*—
Farmer, Zane M.; and Yobaccio, Edward A., 4,273,431, Cl. 354-59.000.
Norris, Philip R., 4,273,433, Cl. 354-246.000.

Polinsky, Charles K.: *See*—
Sinha, Rabindra K.; Polinsky, Charles K.; Cifrulak, Stephen D., Sr.; and Wagner, Norman J., 4,273,751, Cl. 423-244.000.

Politechnika Slaska im. Wincentego Pstrowskiego: *See*—
Rynik, Jan, 4,273,385, Cl. 299-42.000.

Pollard, John H.: *See*—
Gutierrez, William A.; and Pollard, John H., 4,273,596, Cl. 148-171.000.

Pollard, Lorne R., to International Harvester Company. Planting apparatus for a grain drill. 4,273,057, Cl. 111-85.000.

Pollmann, Josef, to Gebruder Netzsch, Maschinenfabrik GmbH & Co. Agitator mill. 4,273,295, Cl. 241-46.110.

Polygram GmbH: *See*—
Hiemann, Klaus; and Haase, Jost-Michael, 4,272,990, Cl. 73-586.000.

Polymerics, Inc.: *See*—
Lester, David; and Alexander, Robert R., 4,273,145, Cl. 132-1.00R.

Pomie, Pierre; and Renaux, Charley, to Commissariat a l'Energie Atomique. Closure device for fuel assembly pot. 4,273,614, Cl. 176-30.000.

Ponce, Gerald J. Steel shank support for molded unit sole. 4,272,897, Cl. 36-24.500.

Pond, Stephen F., to Xerox Corporation. Electrostatic scanning ink jet system. 4,274,100, Cl. 346-75.000.

Ponticello, Ignazio S.; Sniadoch, Henry J.; and Villard, George, to Eastman Kodak Company. Metal complexes of copolymers comprising vinylimidazole and their use in photographic elements. 4,273,853, Cl. 430-213.000.

Pool, Robert H.; and Sellers, Glenn W., to Rockwell International Corporation. Interferometer gyroscope having relaxed detector linearity requirements. 4,273,444, Cl. 356-350.000.

Porsch, Allan W.; and Sorensen, Fred L., to GTE Products Corporation. Protective means for CRT base. 4,273,400, Cl. 339-36.000.

Portec, Inc.: *See*—
Hannigan, Thomas N., 4,273,284, Cl. 238-160.000.
Tatina, Richard A., 4,273,486, Cl. 410-103.000.
Woolner, John H.; Gaslevic, Emeric; and Doorley, Richard B., 4,273,052, Cl. 104-17.00R.

Porter, Roger S.; and Zachariades, Anagnostis E., to United States of America, Navy. Method of deforming thermoplastic polymers using ammonia as a reversible plasticizer. 4,273,739, Cl. 264-211.000.

Portlock, David E.: *See*—
White, Ralph L., Jr.; and Portlock, David E., 4,273,927, Cl. 544-32.000.

Portman, Stanley J. Anchoring device for intravenous bottle holder. 4,273,374, Cl. 296-19.000.

Portolan, Richard V.: *See*—
Trigg, Donald L.; and Portolan, Richard V., 4,273,329, Cl. 273-32.00B.

Portrais, Lee: *See*—
Blanche, Stephen A.; and Portrais, Lee, 4,273,409, Cl. 339-206.00P.

Porzel, Rita E.; and Bator, Cathryn D., to DeSoto, Inc. Wood textured aqueous latex containing wood particles with sorbed organic solvent. 4,273,688, Cl. 260-17.40R.

Post, Lothar: *See*—
Bremer, Clemens; and Post, Lothar, 4,273,025, Cl. 89-33.0CA.

Potschke, Jurgen: *See*—
Dotsch, Erwin; Potschke, Jurgen; and Knacke, Ottmar, 4,273,810, Cl. 427-156.000.

Potter, Mary S. Handbag. 4,273,174, Cl. 150-3.000.

PPG Industries, Inc.: *See*—
Altuglu, Senol, 4,273,726, Cl. 260-463.000.
Cook, James A., Jr., 4,273,725, Cl. 260-455.00R.
Fischer, Wolfgang; and Brown, William J., 4,273,485, Cl. 410-34.000.
Korach, Malcolm, 4,273,629, Cl. 204-98.000.
Leatherman, Ivan R., 4,273,702, Cl. 260-42.530.

Praamsma, Michael F., to Vivitar Corporation. Light diffusing means for a photographic enlarger. 4,274,131, Cl. 362-355.000.

Prager, Irwin D. Window guard support. 4,272,922, Cl. 49-55.000.

Pravoverov, Nikolai L.; Nazyrov, Ravil N.; Grigorov, Sergei S.; and Turova, Lidia S. Electrical conductor for implantation into human body. 4,273,137, Cl. 128-784.000.

Preis, Lothar: *See*—
Kotulla, Bernhard; Haas, Hans; Weiser, Martin; Forster, Rolf; Preis, Lothar; and Schmidt, Rudolf, 4,273,476, Cl. 405-258.000.

Prengaman, Richard J.: *See*—
Phipps, Joe; Thurber, Robert E.; and Prengaman, Richard J., 4,274,095, Cl. 343-7.00A.

Pringle, Ronald E.; and Black, Paul W., to Camco, Incorporated. Annular flow control safety valve. 4,273,194, Cl. 166-323.000.

Producer Manufacturers Pty. Ltd.: *See*—
Herzfeld, Michael O. H., 4,272,939, Cl. 52-527.000.

Promex Plastics (Proprietary) Limited: *See*—
MacLarty, Bernard G.; and Sidders, Bryan, 4,272,900, Cl. 40-21.00C.

Propper Manufacturing Co., Inc.: *See*—
Heine, Helmut A.; Rosenbusch, Helmut W.; and Kratzer, Rudolf, 4,273,112, Cl. 128-11.000.

Propst, Robert L. Apparatus and method for harvesting trees. 4,273,168, Cl. 144-3.00D.

Proximity Controls, Inc.: *See*—
Wolford, Byron F.; Rose, John F.; and Thunselle, James, 4,273,976, Cl. 200-83.00L.

Pruett, Roy L.: *See*—
Fiato, Rocco A.; and Pruett, Roy L., 4,273,936, Cl. 562-606.000.

Pullman Berry: *See*—
Rymarchyk, Nicholas M.; and Meinert, Leo L., 4,272,989, Cl. 73-432.00R.

Pulvermacher, Wilfried: *See*—
Fischer, Otto; Pulvermacher, Wilfried; and Koch, Bernd, 4,273,949, Cl. 13-35.000.

Pump, Wichard; Becker, Wolfgang; and Woldenberg, Edwin, to Bayer Aktiengesellschaft. Foamed polyethylene films. 4,273,880, Cl. 521-93.000.

Quacquarella, Cesare: *See*—
Pezzana, Francesco; and Quacquarella, Cesare, 4,273,549, Cl. 493-196.000.

Quaker Oats Company, The: *See*—
Bone, David P.; and Robleski, Lynda, 4,273,788, Cl. 426-104.000.

Quinn, David R., to AFA Corporation, The. Unitary valve and spring assembly. 4,273,290, Cl. 239-493.000.

R & M Associates, Inc.: *See*—
Murphy, John T., 4,273,477, Cl. 406-39.000.

Raber, Peter E.: *See*—
Krohn, David A.; Snitzer, Elias; and Raber, Peter E., 4,273,585, Cl. 106-47.00R.

Rachmilewitz, Bracha: *See*—
Selhub, Jacob; Rachmilewitz, Bracha; and Grossowicz, Nathan, 4,273,757, Cl. 424-1.000.

Rademacher, Karl-Heinz: *See*—
Blawert, Dieter; Rademacher, Karl-Heinz; and Sodler, Walter, 4,273,203, Cl. 177-187.000.

Radkowsky, Alvin, to Ramot University Authority for Applied Research. Nuclear reactor and method of operating same. 4,273,613, Cl. 176-30.000.

Ramlow, Joachim: *See*—
Schone, Siegfried; and Ramlow, Joachim, 4,273,334, Cl. 273-143.00R.

Ramot University Authority for Applied Research: *See*—
Radkowsky, Alvin, 4,273,613, Cl. 176-30.000.

Rapson, William J., Jr.; Delatorre, Leroy C.; and Thompson, Charles L., to Uson Corporation. Method of and apparatus for compensating for temperature in leak testing. 4,272,985, Cl. 73-49.200.

Rasmussen, Elisabeth L., to A/S Niro Atomizer. Process for removal of mercury vapor from waste gases. 4,273,747, Cl. 423-210.000.

Ratcliffe, Ronald W.: *See*—
Christensen, Burton G.; Ratcliffe, Ronald W.; and Salzmann, Thomas N., 4,273,709, Cl. 260-239.00A.

Rattner, Manfred: *See*—
Kuehnel, Werner; and Rattner, Manfred, 4,274,003, Cl. 250-409.000.

Raue, Roderich: *See*—
Brinkmann, Uwe; Telle, Helmut; Raue, Roderich; and Schellhammer, Carl-Wolfgang, 4,274,062, Cl. 331-94.50L.

Raupp, Arthur J., Jr.; Gerasin, Michael N.; and Thompson, M. Leonard, to Valeron Corporation, The. Cutter assembly for broaching. 4,273,479, Cl. 407-113.000.

Rave, Terence W., to Hercules Incorporated. Preparation of hydrophilic polyolefin fibers for use in papermaking. 4,273,892, Cl. 525-180.000.

Raychem Corporation: *See—*
Marshall, Larry J., 4,273,252, Cl. 221-13.000.
Raymond International Inc.: *See—*
Fuller, Francis M., 4,273,475, Cl. 405-229.000.
Raynor, Robert J., to Olin Corporation. Preparation of thermally stable rigid polyurethane foam. 4,273,882, Cl. 521-110.000.
RCA Corporation: *See—*
Angle, Rodney L., 4,272,881, Cl. 29-571.000.
Bube, Kenneth R., 4,273,822, Cl. 428-216.000.
Dawson, Robert H.; and Schnable, George L., 4,273,805, Cl. 427-88.000.
Fisher, Albert W., 4,272,882, Cl. 29-578.000.
Gilson, Alan P.; and Siryj, Bohdan W., 4,273,342, Cl. 369-32.000.
Schade, Otto H., Jr., 4,274,014, Cl. 307-585.000.
Tracy, Chester E.; and Kern, Werner, 4,273,828, Cl. 428-336.000.
Rea, James H.: *See—*
Karim, Khalid A.; and Rea, James H., 4,273,893, Cl. 525-227.000.
Realty and Industrial Corporation: *See—*
Gubelmann, W. S., deceased; Gubelmann, Walter S., executor; and Grier, William R., 4,273,455, Cl. 400-309.000.
Reed, Edwin E., to Phillips Petroleum Company. Constant pressure apparatus and method. 4,272,994, Cl. 73-807.000.
Reed, Richard D.: *See—*
Smith, James C.; and Reed, Richard D., 4,273,257, Cl. 222-43.000.
Regal Tool & Rubber Co., Inc.: *See—*
Thomerson, Clarence; and Jackson, Jay W., 4,273,473, Cl. 405-212.000.
Rehrig, Houston. Over-the-counter cart with hingedly attached plastic basket and retracting front gate. 4,273,346, Cl. 280-33.99F.
Reichhold Chemicals, Incorporated: *See—*
Kho, Khe-Bing J., 4,273,700, Cl. 260-38.000.
Reid, Paul, to John Lysaght (Australia) Limited. Coating mass control using magnetic field. 4,273,800, Cl. 427-47.000.
Reid, Robert A., to CPC Engineering Corporation. Doctor blade cleaning method and apparatus. 4,273,655, Cl. 210-396.000.
Reinhard, Theodor; Haug, Ernst; Hoffmann, Rudiger; and Feichtiger, Dieter, to Daimler-Benz Aktiengesellschaft. Pneumatic actuating arrangement, especially for central locking systems, and shifting valves therefor. 4,273,027, Cl. 91-32.000.
Reisert, Arthur: *See—*
Nauroth, Peter; Esch, Heinz; Kuhlmann, Robert; Bode, Rudolf; Reisert, Arthur; Buhler, Harald; and Turk, Gunter, 4,273,589, Cl. 106-308.00Q.
Reitan, David M., to Incoe Corporation. Injection mold bushing. 4,273,525, Cl. 425-549.000.
Renau, Jacques; Curtis, James W.; Nicholson, Donald S.; and Hennessey, Frank L., to United States of America, Air Force. Loss-free scanning antenna. 4,274,098, Cl. 343-781.0CA.
Renaux, Charley: *See—*
Pomie, Pierre; and Renaux, Charley, 4,273,614, Cl. 176-30.000.
Renfer, Dale S.: *See—*
Pai, Damodar M.; Turner, S. Richard; Yanus, John F.; Renfer, Dale S.; and Stolka, Milan, 4,273,846, Cl. 430-59.000.
Reschert, Frederick A.: *See—*
Swanson, Dan E.; and Reschert, Frederick A., 4,274,087, Cl. 340-525.000.
Research Associates, Ltd.: *See—*
Hice, Jaxon O., 4,273,033, Cl. 99-349.000.
Research Corporation: *See—*
Auth, David C.; and Rushmer, Robert F., 4,273,127, Cl. 128-303.100.
Research Frontiers Incorporated: *See—*
Saxe, Robert L., 4,273,422, Cl. 350-362.000.
Resnick, Martin L.: *See—*
Blank, Hans G.; and Resnick, Martin L., 4,273,961, Cl. 179-5.00R.
Fahey, Robert J.; and Resnick, Martin L., 4,273,960, Cl. 179-5.00R.
Retro-Flex, Inc.: *See—*
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Rheinmetall GmbH: *See—*
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Rhoda, Richard N.; and Crosby, Jeffrey N., to MPD Technology Corporation. Preparation of platinum complexes. 4,273,755, Cl. 423-463.000.
Rhone-Poulenc Industries: *See—*
Jacques, Roland; and Poisson, Regis, 4,273,735, Cl. 264-5.000.
Soula, Gerard; and Locatelli, Jean-Louis, 4,273,915, Cl. 528-93.000.
Ricciardelli, Robert H., to Biochem International Inc. Fixation ring assembly and method of assembling a sensor head. 4,273,134, Cl. 128-635.000.
Rice, Doris M.: *See—*
Dominguez, Richard J. G.; and Rice, Doris M., 4,273,885, Cl. 521-115.000.
Rice, Ivan G. Reheat gas turbine combined with steam turbine. 4,272,953, Cl. 60-39.040.
Richard Wolf GmbH: *See—*
Boebel, Manfred, 4,273,129, Cl. 128-326.000.
Richards, Colin M.: *See—*
Gillan, John; and Richards, Colin M., 4,273,830, Cl. 428-398.000.
Richardson Graphics Company: *See—*
Muzyczko, Thaddeus M.; and Thomas, Daniel C., 4,273,851, Cl. 430-175.000.
Ricoh Co., Ltd.: *See—*
Kaneko, Tamaki; Mizuma, Kenich; and Okuzawa, Tugio, 4,273,323, Cl. 271-157.000.
Murase, Katsuo, 4,274,111, Cl. 358-75.000.
Rigby, Sterling C.: *See—*
Nall, Clive; Long, Leo E.; Rigby, Sterling C.; and Baugh, K. Boyd, 4,273,327, Cl. 272-97.000.
Rinfret, Elizabeth M.: *See—*
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Rinfret, John H. T.; and Rinfret, Elizabeth M. Apparatus for crushing frangible articles. 4,273,297, Cl. 241-99.000.
Rio, Gerald J., to Cranjer Company, Inc. Rescue tool having spreader plates. 4,273,311, Cl. 254-93.00R.
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Hofer, Gerald; Hubl, Ewald; and Schneider, Steffen, 4,273,387, Cl. 303-10.000.
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Robert, Christian: *See—*
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Padgett, Clarence W.; Marmet, Melvin L.; and Tennyson, Mark R., 4,274,147, Cl. 365-189.000.
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Thompson, David E.; Yao, Shi-Kay; August, Rudolf R.; and Anderson, Dean B., 4,273,445, Cl. 356-350.000.
Rodewald, Dennis W., to Marquip, Inc. Shingled sheet alignment. 4,273,325, Cl. 271-220.000.
Roediger, Walter H., to Wilhelm Roediger GmbH & Co. Method and apparatus for raising an aeration apparatus for liquids. 4,273,732, Cl. 261-122.000.
Rogero, Jean. Spring-loaded catch mechanism for push-buttons of electrical apparatus. 4,273,980, Cl. 200-328.000.
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Rohm GmbH: *See—*
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Rosa, John; and Gyugyi, Laszlo, to Westinghouse Electric Corp. Gating circuit for high voltage thyristor strings. 4,274,135, Cl. 363-68.000.
Rossen, Nils O. Return line filter. 4,273,651, Cl. 210-130.000.
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Rose, Stanley E., to Omnicomp, Inc. Automatic test probe positioning apparatus. 4,272,892, Cl. 33-185.00R.
Rosenbaum, Glen F., to CMI Corporation. Reversible push block-rear bumper assembly. 4,273,369, Cl. 293-1.000.
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Ross, Louis A. R. Internal lining and sealing of hollow ducts. 4,273,605, Cl. 156-286.000.
Ross, Richard H. C. LeB. Zinc extraction apparatus. 4,273,640, Cl. 204-216.000.
Rosser, Robert W.; Shalhoub, Ibrahim M.; and Kwong, Hanoi, to United States of America, National Aeronautics and Space Administration. Preparation of crosslinked 1,2,4-oxadiazole polymer. 4,273,918, Cl. 528-310.000.
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Roux, Jacques, to Agence Nationale de Valorisation de la Recherche (ANVAR). Device for storage of flat objects. 4,273,491, Cl. 414-109.000.
Rowenta-Werke, GmbH: *See*—
Gobelt, Reiner, 4,273,528, Cl. 431-255.000.
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Ruebesam, George B. Compactor. 4,273,037, Cl. 100-91.000.
Rule, Robert J., to W. H. Brine Company. Body protective pads. 4,272,850, Cl. 2-24.000.
Rumbolo, Louis J.: *See*—
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Russell, Robert J., to Mail-Ex Corporation. Envelope processing machine and method. 4,272,943, Cl. 53-492.000.
Rustand, Willy, to Tomra Systems A/S. Device for selective feed out of articles. 4,273,235, Cl. 198-372.000.
Rut, Tadeusz, to Instytut Obrobki Plastycznej. Method and apparatus for forging crank throws. 4,272,979, Cl. 72-356.000.
Rymarchyk, Nicholas M.; and Meinert, Leo L., to Pullman Berry. Instrument lance for basic oxygen steelmaking furnace. 4,272,989, Cl. 73-432.00R.
Rynik, Jan, to Politechnika Slaska im. Wincentego Pstrowskiego. Device for safety guiding of hauling chain especially at ranging drum shearer in coal mining. 4,273,385, Cl. 299-42.000.
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Saadeh, Fuad T.; and Fontaine, Marc F., to Texaco Inc. Method for cleaning a sand screen. 4,273,192, Cl. 166-312.000.
Saam, John C.; and Wegener, Robert L., to Dow Corning Corporation. Precured silicone emulsion and method for preparation. 4,273,634, Cl. 204-159.150.
Sachs-Systemtechnik GmbH: *See*—
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Sackl, Herbert: *See*—
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Sadhukhan, Pasupati, to Occidental Research Corporation. Recovery of energy from geothermal brine and other aqueous sources. 4,272,961, Cl. 60-641.00D.
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Safariland Ltd. Inc.: *See*—
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Saiki, Noritsugu; and Kaneko, Takashi, to Teijin Limited; and Teijin Chemicals, Ltd. Fire-retardant thermoplastic polyester composition. 4,273,899, Cl. 525-439.000.
Saito, Cyuichi; and Teranishi, Katsuya, to Hitachi, Ltd. Passenger conveyor balustrade. 4,273,232, Cl. 198-335.000.
Saito, Susumu: *See*—
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Sakamoto, Nozomu, to Alps Electric Co., Ltd. Slide type variable resistor having dual tracks. 4,274,074, Cl. 338-160.000.
Sakata, Mamoru; Kami, Yozo; and Mitsui, Tetsuro, to Honda Giken Kogyo Kabushiki Kaisha. Rear wheel suspension device for vehicles. 4,273,356, Cl. 280-675.000.
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Salviati, Antonio, to Salviati Impianti S.p.A. Drying step in a method of producing ceramic articles. 4,272,894, Cl. 34-9.000.
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Sato, Mitsuhiro; Itatani, Hiroshi; and Matsuda, Kenji, to Kubota, Ltd. Transmission for agricultural tractor. 4,273,007, Cl. 74-745.000.

Sato, Yo, to Kabushiki Kaisha Sato Kenkyusho. Attaching mechanism for inking device of portable label printing machine or the like. 4,273,046, Cl. 101-348.000.

Sato, Yoshikazu: *See*—
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Satter, Abdus; Widmyer, Richard H.; Shum, Yick M.; and Howard, Curtis E., to Texaco Inc. Petroleum recovery chemical retention prediction technique. 4,273,187, Cl. 166-250.000.

Sauerwein, William D., to Black & Decker Inc. Scotch yoke having a curved track. 4,272,996, Cl. 74-50.000.

Savidge, David H.; and Wadsworth, Eric, to British Steel Corporation. Dual channel apparatus for detecting surface defects in elongate metallic members with liftoff compensation. 4,274,054, Cl. 324-225.000.

Sawada, Satoru: *See*—
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Sawyer, Ralph V., to United States of America, National Aeronautics and Space Administration. Electrical servo actuator bracket. 4,274,038, Cl. 318-663.000.

Saxe, Robert L., to Research Frontiers Incorporated. Light valve containing liquid suspension including polymer stabilizing system. 4,273,422, Cl. 350-362.000.

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Schaper, Donald W., to Marathon LeTourneau Company. Stabilizing device. 4,273,242, Cl. 212-147.000.

Scheiber, Werner, to Metallgesellschaft Aktiengesellschaft. Process for coating metal tubes with plastic materials. 4,273,798, Cl. 427-27.000.

Schellhammer, Carl-Wolfgang: *See*—
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Scherm, Arthur, to Merz & Co. Central nervous system compositions and method. 4,273,774, Cl. 424-253.000.

Schiler, Frederick S. Measuring method and apparatus. 4,273,448, Cl. 356-374.000.

Schiller, Johann: *See*—
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Schleicher, Helmut, 4,274,075, Cl. 338-172.000.

Schleicher, Helmut, to Schleicher GmbH & Co. Relais-Werke KG. Electronic multi-range variable resistor. 4,274,075, Cl. 338-172.000.

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Schmid, Carl J., to Peerless Electronics Research Corp. Radiation measuring apparatus. 4,273,449, Cl. 356-411.000.

Schmidle, Claude J.; and Varadhachary, Seevaram N., to Congoleum Corporation. Differential gloss products and methods of making the same. 4,273,819, Cl. 428-159.000.

Schmidt, Delf: *See*—
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Schmitz, Vincent O. Method of repairing one-way clutch drive assemblies. 4,272,876, Cl. 29-402.060.

Schmolke, Karl H., to John D. Hollingsworth on Wheels, Inc. Method of making a beater roll. 4,272,865, Cl. 19-97.000.

Schnable, George L.: *See*—
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Schneider, Steffen: *See*—
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Schoen, Otmar. Pipe clamp. 4,273,465, Cl. 403-391.000.

Scholbrock, Sylvanus L., to Ex-Cell-O Corporation. Weed spraying assembly. 4,273,285, Cl. 239-121.000.

Scholl, John J.; and Staley, Warren D., to Corning Glass Works. Method and apparatus for forming glass parisons. 4,273,567, Cl. 65-72.000.

Scholl, John J.; and Staley, Warren D., to Corning Glass Works. Press and blow glass forming. 4,273,568, Cl. 65-76.000.

Scholz, Hansjurgen; Backhaus, Hans-Gerd; and Brambilla, Luigi, to Daimler-Benz AG. Deformation member arranged in the impact area of the knee. 4,273,359, Cl. 280-740.000.

Schone, Siegfried; and Ramlow, Joachim, to Gunter Wulff-Apparatebau GmbH. Reel mechanism for use in a playing device. 4,273,334, Cl. 273-143.00R.

Schopper, Alf, to Heberlein Hispano S.A. Apparatus for loading a rope-like strand of fibers into spinning cans. 4,272,867, Cl. 19-159.00R.

Schrank, Wolfgang: *See*—
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Schreiber, James N.: *See*—
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Schuessler, Walter E. Cold weather hood for safety hat. 4,272,853, Cl. 2-424.000.

Schuhmacher, Gunter: *See*—
Freudenberg, Bertram; Schuhmacher, Gunter; and Muhlfeld, Horst, 4,273,911, Cl. 528-49.000.

Schulte, Fritz: *See*—
Goedde, Franz; Schrank, Wolfgang; and Schulte, Fritz, 4,273,617, Cl. 201-39.000.

Schultz, Donald C. Check valve bearing lubricator. 4,273,003, Cl. 74-467.000.

Schumacher, William L.: *See*—
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Schwaebel, Rudolf: *See*—
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Schwarb, Gustav: *See*—
Waldvogel, Erwin; Bastian, Jean-Michel; and Schwarb, Gustav, 4,273,780, Cl. 424-267.000.

Schwarz, Brian L., to Cabot Corporation. Method and system for the fractionation of ethane-propane mixtures. 4,273,566, Cl. 62-27.000.

Schwarz, Josef: *See*—
Lingl, Hans, Jr.; and Schwarz, Josef, 4,273,489, Cl. 414-60.000.

Schweizerische Lokomotiv-und Maschinenfabrik: *See*—
Borgeaud, Gaston; and Pfister, Johann K., 4,273,055, Cl. 105-199.00F.
Schwitzgebel, Fernand. Method for refrigerating fresh products and keeping them fresh, as well as refrigerator for carrying out this method. 4,272,969, Cl. 62-419.000.
SCM Corporation: *See*—
Mastrangelo, Albert J., 4,273,593, Cl. 148-24.000.
Scott, Anthony C., to Eastman Whipstock, Inc. Wire line anchor. 4,273,464, Cl. 403-348.000.
Scott, Arthur C.: *See*—
MacDonald, Digby D.; and Scott, Arthur C., 4,273,637, Cl. 204-195.00F.
Scott, Lewis A.; and Gibson, Duane M., to Omark Industries, Inc. Portable saw. 4,272,889, Cl. 30-371.000.
Scott, Roderick A.: *See*—
Mealing, Barrie E.; and Scott, Roderick A., 4,273,497, Cl. 414-517.000.
Scovell, Ian A.: *See*—
Notta, Adolf; and Scovell, Ian A., 4,272,861, Cl. 15-320.000.
Sczerbaniewicz, Stella A.: *See*—
Flannery, James E.; Morgan, David W.; Rosplock, Sara E.; and Sczerbaniewicz, Stella A., 4,273,586, Cl. 106-52.000.
Sea Terminals Limited: *See*—
Anderson, Harold E., 4,273,066, Cl. 114-256.000.
Seaquist Valve Co., Div. of Pittway: *See*—
Wickenberg, Chester, 4,273,268, Cl. 222-321.000.
Sebenik, Roger F.: *See*—
Laferty, John M.; Howe, Dennis L.; and Sebenik, Roger F., 4,273,745, Cl. 423-54.000.
Sebrosky, Robert A.; and Thorne, William D., to International Business Machines Corporation. Segmented drum bar helix printer. 4,273,040, Cl. 101-93.040.
Seeley, Wayne R., to Emerson Electric Co. Terminations for electric heating elements. 4,273,993, Cl. 219-541.000.
Seid, Paul A., to Sultan Dental Products, Inc. Amalgam carrier and dispenser. 4,273,534, Cl. 433-90.000.
Seidel, Harold, to Bell Telephone Laboratories, Incorporated. Automatic equalization for digital transmission systems. 4,273,963, Cl. 179-16.00F.
Seiderman, Maurice. Casting of polyelectrolytes in hydrogel molds. 4,273,734, Cl. 264-1.100.
Seiferth, Oscar E.: *See*—
Gifford, Maurice J.; Seiferth, Oscar E.; and Grindrod, Paul E., 4,273,815, Cl. 428-35.000.
Seilo, Matti, to Outokumpu Oy. Electrolytic cell. 4,273,642, Cl. 204-286.000.
Seino, Shunji: *See*—
Nishiyama, Ryota; Koike, Takashi; and Seino, Shunji, 4,273,825, Cl. 428-223.000.
Seipos, Andrew G., to Automated Building Components, Inc. Sheet metal clip for assembly of building components. 4,272,938, Cl. 52-509.000.
Seitetsu Kagaku Co., Ltd.: *See*—
Kawamura, Masao; Nishi, Tadaaki; Kato, Kunioki; Mizokami, Hiroshi; and Kanazawa, Tadashi, 4,273,941, Cl. 564-416.000.
Seitz-Werke GmbH: *See*—
Wahl, Alois; Elsner, Paul; and Born, Gerhard, 4,273,236, Cl. 198-432.000.
Wahl, Alois; and Elsner, Paul, 4,273,237, Cl. 198-445.000.
Selhub, Jacob; Rachmilewitz, Bracha; and Grossowicz, Nathan, to Yissum Research Development Company. Determination of transcobalamins. 4,273,757, Cl. 424-1.000.
Selleck, Robert W., to Becton, Dickinson and Company. Variable pitch sprockets for conveyor system. 4,273,240, Cl. 198-835.000.
Sellers, Glenn W.: *See*—
Pool, Robert H.; and Sellers, Glenn W., 4,273,444, Cl. 356-350.000.
Senoo, Keizi: *See*—
Machi, Sueo; Ishigaki, Isao; Sugo, Takanobu; Murata, Kazuo; Tanso, Shiro; and Senoo, Keizi, 4,273,840, Cl. 429-144.000.
Senoo, Takanori: *See*—
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Sepp, Gunther; Born, Gunthard; and Malburg, Werner, to Messerschmitt-Bolkow-Blohm GmbH. Apparatus for mechanically decoupling a resonator of a gas dynamic laser. 4,274,064, Cl. 331-94.50G.
Serafin, Orest M.: *See*—
Paton, Boris E.; Scherbina, Boris E.; Lebedev, Vladimir K.; Ivantsov, Oleg M.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; Galian, Boris A.; Unigovsky, Mikhail R.; and Serafin, Orest M., 4,273,985, Cl. 219-101.000.
Sergeev, Vitaly A., deceased: *See*—
Boriskin, Ivan K.; Bragin, Jury S.; Bykov, Mikhail S.; Gubanov, Valentin I.; Ivanov, Vladlen M.; Tool, Eduard A.; Bazilevich, Sergei V., deceased; Bazilevich, Tatyana N., administrator; Sergeev, Vitaly A., deceased; Sergeeva, Valentina I., administrator; and Sergeeva, Elena V., administrator, 4,273,298, Cl. 241-189.00R.
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Sergeeva, Valentina I., administrator: *See*—
Boriskin, Ivan K.; Bragin, Jury S.; Bykov, Mikhail S.; Gubanov, Valentin I.; Ivanov, Vladlen M.; Tool, Eduard A.; Bazilevich, Sergei V., deceased; Bazilevich, Tatyana N., administrator; Sergeev, Vitaly A., deceased; Sergeeva, Valentina I., administrator; and Sergeeva, Elena V., administrator, 4,273,298, Cl. 241-189.00R.
Shalhoub, Ibrahim M.: *See*—
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Shapiro, Burton L., to University of Minnesota, The Regents of the. Cystic fibrosis detection method. 4,273,869, Cl. 435-26.000.
Sharp Kabushiki Kaisha: *See*—
Kubo, Kimio; and Miyamae, Ryuichi, 4,273,136, Cl. 128-680.000.
Shaw, Frederick W.; and Whale, William E., to Imperial Chemical Industries Limited. Gear crimped polyester yarns. 4,273,823, Cl. 428-224.000.
Sheih, Pong Su: *See*—
Bertram, James L.; and Sheih, Pong Su, 4,273,921, Cl. 528-405.000.
Shelcore, Inc.: *See*—
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Shell Oil Company: *See*—
Blomsma, Everhard C.; and Holtslag, Paulus T. M., 4,273,470, Cl. 405-202.000.
Sheller-Globe Corporation: *See*—
Pashkow, William B., 4,273,357, Cl. 280-697.000.
Shepherd, Norris W.: *See*—
Hollely, David J. E.; and Shepherd, Norris W., 4,273,294, Cl. 241-18.000.
Shepherd, Robert G., to American Cyanamid Company. Benzaldehydes, alkanophenones, and benzophenones and derivatives thereof containing a 4-monoalkylamino group. 4,273,785, Cl. 424-316.000.
Shepherd, Roger D.: *See*—
Markham, Harvey R.; and Shepherd, Roger D., 4,273,439, Cl. 355-14.00C.
Sheppard, Richard H. Power steering gear with improved responsiveness. 4,273,029, Cl. 91-422.000.
Sherwood Medical Industries Inc.: *See*—
Gindler, E. Melvin, 4,273,556, Cl. 23-230.00B.
Smith, James C.; and Reed, Richard D., 4,273,257, Cl. 222-43.000.
Sheshtawy, Adel A., to Standard Oil Company (Indiana). Apparatus for use in lowering casing strings. 4,273,372, Cl. 294-86.150.
Shiba, Keisuke; Hirose, Takeshi; Hayashi, Jun; Arai, Atsuaki; Furutachi, Nobuo; and Katsuyama, Harumi, to Fuji Photo Film Co., Ltd. Multilayer color photographic materials utilizing an interlayer correction coupler. 4,273,861, Cl. 430-382.000.
Shibata, Yumi: *See*—
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Shibatani, Kyoichiro: *See*—
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Shibuya, Tsunenori, to Diesel Kiki Co., Ltd. Swash-plate type compressor. 4,273,518, Cl. 417-269.000.
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Shigemasa, Yoshimi: *See*—
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Shiiki, Zenya; and Watanabe, Kazuhiro, to Kureha Kagaku Kogyo Kabushiki Kaisha. Process for the preparation of spherical carbon particles and spherical activated carbon particles. 4,273,675, Cl. 252-424.000.
Shima, Ichiji; Yamamoto, Tatsuo; Yoshibayashi, Shigeru; Teshima, Hiroshi; Hizume, Akio; Iki, Tetsuo; Yamamoto, Takashi; Kanamori, Kyozo; and Noguchi, Kenzo. Torsional vibration monitoring method for rotating shaft system. 4,272,992, Cl. 73-650.000.
Shimada, Kiyoo; Yano, Makoto; Shibatani, Kyoichiro; and Makimoto, Tsutomu. Selective chemical sensitive field effect transistor transducers. 4,273,636, Cl. 204-195.00P.
Shimatake, Hirokazu; Natsume, Kenzo; Kojima, Takeshi; Ogawa, Shuichi; Nara, Ryuichi; Uchida, Shigeru; and Takagishi, Haruyoshi, to Nissan Motor Company, Limited. Industrial robot system capable of pressure applied machining operations. 4,273,504, Cl. 414-728.000.
Shimazaki, Mamoru: *See*—
Iwama, Hideto; Toyama, Masamichi; Shimazaki, Mamoru; and Ichiyanagi, Toshikazu, 4,273,426, Cl. 352-169.000.
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Shimojima, Masatoshi, to Vivitar Corporation. Zoom lens. 4,273,414, Cl. 350-429.000.

Shimokawa, Yoshiyuki, to Tokyo Shibaura Denki Kabushiki Kaisha. Stored program control system with switching between instruction word systems. 4,274,138, Cl. 364-200.000.
Shimuzu, Koji: *See*—
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Shin-Etsu Chemical Co., Ltd.: *See*—
Ohno, Shigeru; Tezuka, Haruya; and Ishihara, Toshinobu, 4,273,944, Cl. 568-396.000.
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Shionogi & Co., Ltd.: *See*—
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Shirai, Makoto; Ito, Michinobu; and Kato, Osamu, to NGK Spark Plug Co., Ltd. Throwaway tip. 4,273,480, Cl. 407-114.000.
Shoher, Itzhak; and Whiteman, Aharon E. Reinforced jacket crown and method of construction. 4,273,580, Cl. 75-165.000.
Shoji, Fusaji: *See*—
Watanabe, Takeshi; Sudo, Ryoichi; Shoji, Fusaji; Takemoto, Issei; and Yokono, Hitoshi, 4,273,420, Cl. 350-341.000.
Shore, Arthur R.: *See*—
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Shore, David; and Lintonbon, Robert F., to Ferakarn Limited. Waste gas recovery systems. 4,273,514, Cl. 417-15.000.
Showa Electric Wire & Cable Co., Ltd.: *See*—
Yokoyama, Takeo; Fukumoto, Kiyoshi; and Matsuura, Hiroshi, 4,274,108, Cl. 358-31.000.
Shum, Yick M.: *See*—
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Sidepal Societe Anonyme Societe Industrielle de Participations Luxembourgeois: *See*—
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Siemens Aktiengesellschaft: *See*—
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Berndt, Klaus-Gunther; Kruger, Manfred; and Nawrot, Wolfgang, 4,273,979, Cl. 200-286.000.
Ekstrom, Olov; and Nilsson, Kenth, 4,273,366, Cl. 285-332.000.
Elsel, Werner, 4,274,022, Cl. 310-62.000.
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Kraemer, Horst, 4,274,061, Cl. 330-296.000.
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Parsch, Claus P.; and Gibson, John P., 4,274,020, Cl. 310-13.000.
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Sih, John C., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-9-deoxy-6ε,9αepoxy-16,16-difluoro-19-hydroxy-PGF$_1$. 4,273,718, Cl. 260-346.220.
Sikorcin, John: *See*—
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Silvander, Frank O. Device to align the end fittings in the casting of concrete piles. 4,272,875, Cl. 29-271.000.
Silverstein, Seth D., to General Electric Company. Transparent composite laminar structure, solar collector and method. 4,273,098, Cl. 126-417.000.
Silvestri, Margaret W. Beach accessory. 4,273,380, Cl. 297-191.000.
Sima Products Corporation: *See*—
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Simko, Richard T., to Xicor, Inc. Substrate coupled floating gate memory cell. 4,274,012, Cl. 307-238.300.
Simpson, Charles J.: *See*—
Lange, Gerald A.; and Simpson, Charles J., 4,273,852, Cl. 430-209.000.
Simpson, Judith V. Constrictor. 4,273,130, Cl. 128-327.000.
Singelyn, James D., to Kemtec, Inc. Powdered polymer compositions produced by electron beam polymerization of polymerizable compositions. 4,273,831, Cl. 428-402.000.
Singer Company, The: *See*—
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Singer, Malcolm S., to Chevron Research Company. N-Alkyl or alkoxy-N'-substituted hydrocarbyl urea. 4,273,572, Cl. 71-86.000.
Sinha, Rabindra K.; Polinsky, Charles K.; Cifrulak, Stephen D., Sr.; and Wagner, Norman J., to Calgon Corporation. Removal of acidica contaminants from gas streams by caustic impregnated activated carbon. 4,273,751, Cl. 423-244.000.
Sir Henry Lawson-Tancred, Sons & Co., Ltd.: *See*—
Lawson-Tancred, Henry, 4,274,010, Cl. 290-55.000.
Siryj, Bohdan W.: *See*—
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Sisti, Giorgio; Riva, Ermete; and Italiano, Pietro, to Carlo Erba Strumentazione S.p.A. Apparatus for porosimetric measurements. 4,272,983, Cl. 73-38.000.
Sivers, Rolf V.; Herrmann, Rudolf; and Layher, Ulrich, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Supporting pipe to constitute a drive unit for an automotive vehicle. 4,273,207, Cl. 180-70.00P.
Sizemore, James L.: *See*—
Bisczat, John J.; Lisk, Robert R.; McCray, William R.; and Sizemore, James L., 4,273,456, Cl. 400-550.000.
Skapura, Victor. Animal trap. 4,272,907, Cl. 43-92.000.
SKF Nova AB: *See*—
Asberg, Sture L., 4,273,391, Cl. 308-174.000.
Sledzieski, William L.: *See*—
Bosco, Peter M.; and Sledzieski, William L., 4,273,790, Cl. 426-335.000.
Bosco, Peter M.; and Sledzieski, William L., 4,273,795, Cl. 426-602.000.
Smearing, Robert W., to General Electric Company. Filled, two-part plastic-producing system. 4,273,689, Cl. 260-22.0CB.
Smetana, Andrew, to General Electric Company. Reflector unit for photoflash array. 4,273,241, Cl. 206-520.000.
Smith, Alfred H., Jr.; De Zuba, George P.; and Mitchell, Tyrone D., to General Electric Company. Self-bonding room temperature vulcanizable silicone rubber compositions. 4,273,698, Cl. 260-37.0SB.
Smith, Charles E. Aquatic recreational vehicles. 4,273,544, Cl. 440-30.000.
Smith Engineering: *See*—
Smith, Jay, III; and Malone, Richard L., 4,272,917, Cl. 46-254.000.
Smith, Franklin G.: *See*—
Smith, Lawrence M.; and Acker, G. Marts, 4,273,281, Cl. 227-152.000.
Smith, Frederick R., to Avtex Fibers Inc. Fibers of high fluid holding capacity. 4,273,118, Cl. 128-156.000.
Smith International, Inc.: *See*—
Bolton, Jimmie B.; and Crews, Sam T., 4,273,159, Cl. 138-109.000.
Smith, James C.; and Reed, Richard D., to Sherwood Medical Industries Inc. Jar mounted pipettor. 4,273,257, Cl. 222-43.000.
Smith, James D. B.; and Ott, Arthur W., to Westinghouse Electric Corp. Pre-reacted carboxylic acid anhydride complexes as low temperature curing agents for epoxy resins. 4,273,914, Cl. 528-89.000.
Smith, James D. B.: *See*—
Phillips, David C.; Hickam, William M.; and Smith, James D. B., 4,272,988, Cl. 73-339.00R.
Smith, Jay, III; and Malone, Richard L., to Smith Engineering. Steering assembly rendering car unstable in a turn. 4,272,917, Cl. 46-254.000.
Smith, John A., to Hull Corporation. Platen type molding press. 4,273,524, Cl. 425-450.100.
Smith, Lawrence M.; and Acker, G. Marts, to Smith, Franklin G.; and Moshofsky, Jerome F., part interest to each. Internal surgical stapler. 4,273,281, Cl. 227-152.000.
Smith, Lloyd T.; Bartholomew, Alan E.; Fee, Robert W.; Meister, Michael L.; Robbins, Richard J.; and Ten Eyck, Richard E., to S/V Tool Company, Inc. Device for transmitting torque. 4,273,173, Cl. 81-177.00M.
Smith, Mark L.: *See*—
Dodds, Philip V. W.; and Smith, Mark L., 4,273,017, Cl. 84-1.100.
Smith, Roy H., Jr.: *See*—
Foster, Manford H., 4,272,930, Cl. 52-79.100.
Smith, Timothy S.: *See*—
Trahan, Karl W., Sr.; and Smith, Timothy S., 4,273,466, Cl. 404-4.000.
Smith, Wayne G.: *See*—
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Smithers, Jacquelyn A.: *See*—
Jones, Richard E.; and Smithers, Jacquelyn A., 4,273,710, Cl. 260-239.55D.
Snamprogetti S.p.A.: *See*—
Brandolese, Ernesto, 4,273,664, Cl. 252-49.500.
Zaffaroni, Pasquale; Vitobello, Vincenza; and Gamalerio, Anna M., 4,273,872, Cl. 435-55.000.
Snape, George W., to Bulk Unit Load Systems Limited. Method and apparatus for discharging material from bulk containers. 4,273,266, Cl. 222-199.000.
Snellman, Donald L.; and Gerbracht, Osceola J., to Norfin, Inc. Collator. 4,273,326, Cl. 271-288.000.
Sniadoch, Henry J.: *See*—
Ponticello, Ignazio S.; Sniadoch, Henry J.; and Villard, George, 4,273,853, Cl. 430-213.000.
Snitzer, Elias: *See*—
Krohn, David A.; Snitzer, Elias; and Raber, Peter E., 4,273,585, Cl. 106-47.00R.
Snuffer, Clifton K.; and Cuches, Walter T. Coaxial connector assembly for attachment to circuit board. 4,273,407, Cl. 339-177.00R.
Snyder, Paul J.: *See*—
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Societe Anonyme Automobiles Citroen: *See*—
Duguet, Pierre; and Robert, Christian, 4,273,376, Cl. 296-65.00R.
Societe Anonyme dite: Transitube-Project: *See*—
Conca, Gilbert G., 4,273,267, Cl. 222-318.000.
Societe Francaise Duco: *See*—
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Societe Generale pour l'Emballage: *See*—
Lagneaux, Jean, 4,273,288, Cl. 239-419.300.

Societe Industrielle de Filtration: *See*—
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Societe Nationale Industrielle Aerospatiale: *See*—
Mouille, Rene L.; and Lafargue, Marcel A. S., 4,273,511, Cl. 416-134.00A.
Societe Nouvelle des Ateliers et Chantiers du Havre: *See*—
Berne, Jean, 4,273,063, Cl. 114-126.000.
Societe Sofiltra-Poelman: *See*—
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Soderberg, Mark S.: *See*—
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Sodler, Walter: *See*—
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Soeda, Katsuji, to Yamamoto Electric Industrial Co., Ltd. Motor speed control system. 4,274,037, Cl. 318-331.000.
Sokol, Larry S.: *See*—
McComas, Charles C.; and Sokol, Larry S., 4,273,824, Cl. 428-256.000.
Solomon, Harold W., to Emtek Incorporated. Apparatus and method for recovering pollutant liquids. 4,273,650, Cl. 210-104.000.
Somar Manufacturing Co., Ltd.: *See*—
Nagasawa, Kohtaro; Ochi, Hideo; Tanaka, Fujio; and Shibata, Yumi, 4,273,858, Cl. 430-296.000.
Somm, Paul T., to Boeing Company, The. Adaptive airplane landing gear. 4,273,303, Cl. 244-104.0FP.
Sommovigo, Paolo: *See*—
Masucci, Pasquale; and Sommovigo, Paolo, 4,273,948, Cl. 13-9.0ES.
Sonnet, Gunther, to Jos. Schneider & Co., Optische Werke. Optical objective. 4,273,415, Cl. 350-465.000.
Sony Corporation: *See*—
Onodera, Toshio; and Tanimura, Ken, 4,274,136, Cl. 363-68.000.
Suyama, Hideo, 4,273,968, Cl. 179-115.5PV.
Suzuki, Tadao, 4,274,058, Cl. 330-253.000.
Tamura, Eiji; and Nakamura, Takashi, 4,274,107, Cl. 358-29.000.
Sorensen, Fred L.: *See*—
Porsch, Allan W.; and Sorensen, Fred L., 4,273,400, Cl. 339-36.000.
Sorenson, Marius W.: *See*—
Ezzell, Bobby R.; and Sorenson, Marius W., 4,273,626, Cl. 204-98.000.
Soula, Gerard; and Locatelli, Jean-Louis, to Rhone-Poulenc Industries. Process for the preparation of glycidyl polyethers of polyphenols. 4,273,915, Cl. 528-93.000.
Spain, Robert C. Ventilator apparatus. 4,273,032, Cl. 98-63.000.
Spar Aerospace Limited: *See*—
Hinds, Charles M., 4,273,305, Cl. 244-158.00R.
Spaulding, Bert W., Sr. Dual action combination firewood cutting and splitting machine. 4,273,171, Cl. 144-193.00A.
Specht, Steven J., to Olin Corporation. Process for the start-up of membrane cells for the electrolysis of aqueous salt solutions. 4,273,630, Cl. 204-98.000.
Spector, George: *See*—
Bassetti, Henry; and Spector, George, 4,272,908, Cl. 46-12.000.
Thurston, Jay D.; and Spector, George, 4,272,849, Cl. 2-16.000.
Speer, Richard. Pneumatically-operated ball projecting device. 4,273,095, Cl. 124-56.000.
Spengler, Ernst M., to Stanztechnik GmbH R & S. Method and apparatus for forming, and trimming, three-dimensional work pieces. 4,273,738, Cl. 264-154.000.
Sperry Corporation: *See*—
Doyle, William D., 4,273,801, Cl. 427-48.000.
Nelson, Gary L.; and Harvey, William A., 4,273,609, Cl. 156-624.000.
Spiegel, Leo, to Northrop Corporation. Solenoid torquer system. 4,274,040, Cl. 318-689.000.
Spodig, Heinrich. Magnetic separator having intersecting conveyor belts. 4,273,646, Cl. 209-223.00R.
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, to International Flavors & Fragrances Inc. 2-Oxabicyclooctane derivatives, processes for preparing same and organoleptic uses thereof. 4,273,662, Cl. 252-8.900.
Stacey, Martyn H.: *See*—
Lane, Ruth M.; and Stacey, Martyn H., 4,273,678, Cl. 252-463.000.
Stahly, Frederick A.: *See*—
Merrill, Stewart H.; Mutz, Alec N.; and Stahly, Frederick A., 4,273,849, Cl. 430-119.000.
Staley, Warren D., to Corning Glass Works. Neck ring mechanism. 4,273,569, Cl. 65-360.000.
Staley, Warren D.: *See*—
Scholl, John J.; and Staley, Warren D., 4,273,567, Cl. 65-72.000.
Scholl, John J.; and Staley, Warren D., 4,273,568, Cl. 65-76.000.
Standard Brands Incorporated: *See*—
Bosco, Peter M.; and Sledzieski, William L., 4,273,790, Cl. 426-335.000.
Bosco, Peter M.; and Sledzieski, William L., 4,273,795, Cl. 426-602.000.
Standard Oil Company (Indiana): *See*—
Sheshtawy, Adel A., 4,273,372, Cl. 294-86.150.
Stanek, Jaroslav, to Ciba-Geigy Corporation. Nitroso-urea derivatives. 4,273,766, Cl. 424-180.000.
Stanizzo, John A. Prefabricated shell assembly for window trim. 4,272,931, Cl. 52-98.000.
Stanztechnik GmbH R & S: *See*—
Spengler, Ernst M., 4,273,738, Cl. 264-154.000.
Staudt, Heinrich: *See*—
Hofmann, Eberhard; Ritter, Ernst; and Staudt, Heinrich, 4,273,088, Cl. 123-502.000.
Stauffer Chemical Company: *See*—
Coll-Palagos, Miguel, 4,273,837, Cl. 428-647.000.
Stechler, Bernard G. Method of forming electrical insulation by extruding polymeric compositions containing hollow microspheres. 4,273,806, Cl. 427-119.000.
Stein Industrie: *See*—
Bessouat, Roger; and Marjollet, Jacques, 4,273,077, Cl. 122-483.000.
Steiner, Robert E.; and Long, Thomas J., to Emerson Electric Co. Baseboard heater with high temperature cut-off switch. 4,273,990, Cl. 219-363.000.
Stendel, Wilhelm: *See*—
Kuhle, Engelbert; Hagemann, Hermann; Behrenz, Wolfgang; Hammann, Ingeborg; and Stendel, Wilhelm, 4,273,767, Cl. 424-211.000.
Stepath, Myron D., to Arcair Company. Underwater cutting and gouging method. 4,273,982, Cl. 219-70.000.
Stephan, Hans-Werner: *See*—
Lehr, Klaus; Heymer, Gero; Stephan, Hans-Werner; and Thummler, Ursus, 4,273,752, Cl. 423-322.000.
Sterling Drug Inc.: *See*—
Bell, Malcolm R.; and Oesterlin, Rudolf, 4,273,713, Cl. 260-326.620.
Stevens, Garland A., to Huff-Ste., Inc. Novelty pump lamp. 4,274,129, Cl. 362-109.000.
Stevenson, Charlene. Tooth paste dispenser. 4,273,258, Cl. 222-103.000.
Stiles, Gilbert J., Sr.: *See*—
Gentry, James H., Jr.; and Stiles, Gilbert J., Sr., 4,274,052, Cl. 324-117.00R.
Stillwell, David J. Trash bag holder. 4,273,167, Cl. 141-314.000.
Stinson, Constance E. Tissue roll holder. 4,273,392, Cl. 312-42.000.
Stocker, Lester H., to Bell & Howell Company. Document sequencer. 4,273,319, Cl. 270-21.100.
Stolka, Milan: *See*—
Pai, Damodar M.; Turner, S. Richard; Yanus, John F.; Renfer, Dale S.; and Stolka, Milan, 4,273,846, Cl. 430-59.000.
Stoll, Harold M., to United States of America, Air Force. Integrated optical R-F spectrum analyzer. 4,274,049, Cl. 324-77.00K.
Stone, H. Spencer. Visor-connected tape cartridge holder. 4,273,277, Cl. 224-312.000.
Storandt, Ralf, to Vereinigte Baubeschlagfabriken, Gretsch & Co. GmbH. Ski safety binding. 4,273,355, Cl. 280-614.000.
Storm, Manfred, to Oliver Industries, Inc. Adjustable luggage rack. 4,273,278, Cl. 224-321.000.
Storz, Karl: *See*—
Litz, Heinz; Hallwirth, Volker; and Storz, Karl, 4,274,082, Cl. 340-167.00R.
Strang, Robert E., Sr., to Injection Plastics & Manufacturing Co. Baffle for alcohol stills. 4,273,618, Cl. 202-158.000.
Stratton, Andrew, to Imperial Chemical Industries Limited. Electric device. 4,273,051, Cl. 102-202.200.
Strauss, Manfred, to Shelcore, Inc. Spinning toy. 4,272,911, Cl. 46-47.000.
Strohschneider, Heinz F., to DBS, Inc. Portable transaction log recorder. 4,273,038, Cl. 101-45.000.
Structural Composites Industries, Inc.: *See*—
Weingart, Oscar, 4,273,601, Cl. 156-189.000.
Strutt, Derek W., to Ford Motor Company. Steering column assembly. 4,273,005, Cl. 74-492.000.
Stumpp, Gerhard; Greiner, Max; Weiss, Otmar; and Konrath, Karl, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,273,091, Cl. 123-506.000.
Submarine Products Limited: *See*—
Oswell, Hugh H. B., 4,273,120, Cl. 128-204.260.
Suddeutsche Kuhlerfabrik Julius Fr. Behr GmbH & Co. KG: *See*—
Nonnenmann, Manfred, 4,273,681, Cl. 252-472.000.
Suddeutsche Zucker-Aktiengesellschaft: *See*—
Cronewitz, Theodor; and Schiweck, Hubert, 4,273,590, Cl. 127-44.000.
Sudo, Atsushi: *See*—
Matsumoto, Mutsumi; Sugi, Hideki; and Sudo, Atsushi, 4,273,676, Cl. 252-435.000.
Sudo, Ryoichi: *See*—
Watanabe, Takeshi; Sudo, Ryoichi; Shoji, Fusaji; Takemoto, Issei; and Yokono, Hitoshi, 4,273,420, Cl. 350-341.000.
Suga, Tadoru. Apparatus for continuously wrapping successive articles under vacuum in heat-sealable film. 4,272,944, Cl. 53-511.000.
Sugano, Kazuhiko: *See*—
Iwanaga, Kazuyoshi; Sugano, Kazuhiko; and Ohtsuka, Kunio, 4,273,009, Cl. 74-869.000.
Sugawara, Tamio: *See*—
Igarashi, Kikuo; and Sugawara, Tamio, 4,273,923, Cl. 536-10.000.
Sugi, Hideki: *See*—
Matsumoto, Mutsumi; Sugi, Hideki; and Sudo, Atsushi, 4,273,676, Cl. 252-435.000.
Sugie, Hiromichi; Akado, Hajime; and Yamashita, Akira, to Nippondenso Co., Ltd. Air cleaner of internal combustion engines. 4,273,564, Cl. 55-267.000.
Sugitachi, Akio; Takagi, Kunihiko; and Yabushita, Yasunori, to Unitika Ltd. Preparation of antithrombogenic polymeric materials. 4,273,873, Cl. 435-180.000.

Sugo, Takanobu: *See—*
Machi, Sueo; Ishigaki, Isao; Sugo, Takanobu; Murata, Kazuo; Tanso, Shiro; and Senoo, Keizi, 4,273,840, Cl. 429-144.000.
Suhara, Yasuji; Ogawa, Kiyoshi; Yokose, Kazuteru; and Watanabe, Kimihiro, to Hoffmann-La Roche Inc. Amino sugar derivatives containing trehalose. 4,273,765, Cl. 424-180.000.
Sultan Dental Products, Inc.: *See—*
Seid, Paul A., 4,273,534, Cl. 433-90.000.
Sulzer Brothers Limited: *See—*
Frey, Otto, 4,272,855, Cl. 3-1.900.
Pfarrwaller, Erwin, 4,273,163, Cl. 139-308.000.
Sumimura, Shinichi; and Shimuzu, Koji, to Toray Silicone Company, Ltd. Electrically conductive curable liquid organopolysiloxane compositions. 4,273,697, Cl. 260-37.0SB.
Sumitomo Chemical Co., Ltd.: *See—*
Asada, Mamoru; Shiga, Akinobu; Matsuyama, Kiyoshi; and Kakugo, Masahiro, 4,273,905, Cl. 526-142.000.
Koyanagi, Rokuo; Fujita, Yoshio; and Mukai, Kunio, 4,273,769, Cl. 424-224.000.
Sumitomo Naugatuck Co., Ltd.: *See—*
Minematsu, Hiroyuki; Matsumoto, Kojiro; Saeki, Tadashi; and Kishi, Akira, 4,273,895, Cl. 525-264.000.
Summers, Tommy L.; and Yenawine, David L., to Texas Instruments Incorporated. Method and apparatus for manufacturing gas-filled tubes and the like. 4,273,398, Cl. 316-20.000.
Sun Valley Poultry Limited: *See—*
Clark, Colin R.; Shore, Arthur R.; and Corbett, Robert A., 4,273,071, Cl. 119-17.000.
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Artin, Robert L.; and Eimerman, Allen C., 4,273,013, Cl. 83-167.000.
Sundstrand Data Control, Inc.: *See—*
Lukes, Henry J.; Kamphorst, Walter; and Asmar, Romeal F., 4,274,056, Cl. 328-162.000.
Suntech, Inc.: *See—*
Kohn, Edward M.; Nickol, Stephen L.; and Thompson, Robert M., 4,273,898, Cl. 525-432.000.
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Surgical Mechanical Research Corp.: *See—*
Thiene, Paul G., 4,274,070, Cl. 335-205.000.
Sutliff, Wayne N.; and Downen, Jim L. Deep well pump. 4,273,520, Cl. 417-434.000.
Sutton, Robert W. Hatch cover. 4,273,064, Cl. 114-203.000.
Suyama, Hideo, to Sony Corporation. Electroacoustic transducer with magnetic flux directed slantly across a diaphragm. 4,273,968, Cl. 179-115.5PV.
Suzuki, Tadao, to Sony Corporation. Amplifier with separate AC and DC feedback loops. 4,274,058, Cl. 330-253.000.
Suzuki, Yoshiaki: *See—*
Hara, Hiroshi; Nakamura, Kotara; and Suzuki, Yoshiaki, 4,273,854, Cl. 430-216.000.
Swain, James C.; Dickson, John D.; and Schluer, Larry E., to Interlake, Inc. Storage rack entry vehicle. 4,273,494, Cl. 414-266.000.
Swanson, Carl R. Electrically operated mast for laser-controlled leveling system. 4,273,225, Cl. 192-7.000.
Swanson, Dan E.; and Reschert, Frederick A. Annunciator monitor circuit. 4,274,087, Cl. 340-525.000.
Swanson, Gerald T.; and Trenary, John, to Teledyne Industries, Inc. Smoking filters. 4,273,142, Cl. 131-339.000.
Swartz, Dorian J., to American Hospital Supply Corporation. Electrochemical sensing probe. 4,273,638, Cl. 204-195.00P.
Swearingen, Judson S.; and Irvine, Michael D., to Rotoflow Corporation. Bearing system with thrust compensation means. 4,273,390, Cl. 308-168.000.
Sweeney, Theodore J.; and Haviland, John G., to Theodore Sweeney & Company. Adhesive assembly. 4,273,827, Cl. 428-307.000.
Swietzer, William F., to GAF Corporation. Embossed sheet type covering material. 4,273,820, Cl. 428-159.000.
Swift, Harold E.: *See—*
Vogel, Roger F.; Madgavkar, Ajay M.; and Swift, Harold E., 4,273,188, Cl. 166-256.000.
SWS Silicones Corporation: *See—*
Martin, Eugene R., 4,273,896, Cl. 525-271.000.
Syeles, Albert M.: *See—*
Krall, Albert D.; and Syeles, Albert M., 4,274,097, Cl. 343-719.000.
Syntex Corporation: *See—*
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Alvarez, Francisco S., 4,273,770, Cl. 424-241.000.
Szarka, David D.: *See—*
Baker, Eugene E.; Szarka, David D.; Davis, Odie R. S.; and Workman, Nolan M., 4,273,190, Cl. 166-278.000.
Szoke, Sandor: *See—*
Ghyczy, Jeno; Szoke, Sandor; and Csermely, Gyorgy, 4,273,679, Cl. 252-466.00J.
Szpindel, Motek. Ring and tone plant. 4,273,964, Cl. 179-84.00R.
Szwartz, Henry S. Automatic fireplace damper. 4,273,097, Cl. 126-285.00B.
T.I.C. - Citizen Co., Ltd.: *See—*
Teragaki, Takeshi; Ohno, Yasuya; and Yokoyama, Etsuso, 4,273,396, Cl. 312-223.000.
Tadanier, John S.: *See—*
Martin, Jerry R.; Tadanier, John S.; and Collum, Paulette, 4,273,924, Cl. 536-17.00R.
Martin, Jerry R.; Tadanier, John S.; and Johnson, Paulette, 4,273,925, Cl. 536-17.00R.
Taft, Phillip A., to Girling Limited. Suspension means for vehicles. 4,273,358, Cl. 280-708.000.
Taguchi, Tetsuya: *See—*
Matsuda, Mutsuhide; Tamamura, Hideo; Taguchi, Tetsuya; Okino, Tadashi; and Yazaki, Mutsunobu, 4,273,432, Cl. 354-145.000.
Taguchi, Toru: *See—*
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Tahara, Yukio: *See—*
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Takagi, Kunihiko: *See—*
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Shimatake, Hirokazu; Natsume, Kenzo; Kojima, Takeshi; Ogawa, Shuichi; Nara, Ryuichi; Uchida, Shigeru; and Takagishi, Haruyoshi, 4,273,504, Cl. 414-728.000.
Takahashi, Katsutoshi: *See—*
Matsuda, Akira; Yoshioka, Osamu; Takahashi, Katsutoshi; Yoshida, Kooichi; and Ninomiya, Hiroshi, 4,273,761, Cl. 424-81.000.
Takahashi, Toshihiko; Maruko, Morihisa; and Kimura, Shoichi, to Hitachi, Ltd. Process for removing harmful components from gas. 4,273,748, Cl. 423-230.000.
Takahashi, Toshihiko: *See—*
Kimura, Shoichi; Takahashi, Toshihiko; and Tamura, Zensuke, 4,273,749, Cl. 423-231.000.
Takahashi, Toyoki: *See—*
Takeuchi, Shinziro; Kikuchi, Toshiro; Mitsumoto, Norio; Takahashi, Toyoki; Hayashi, Hidekatsu; and Ichioka, Satoshi, 4,273,954, Cl. 178-19.000.
Takai, Takamoto, to Nippon Thompson, Co., Ltd. Ball spline bearing assembly. 4,273,389, Cl. 308-6.00C.
Takakuwa, Eiji: *See—*
Takei, Toshihiro; Kuwakado, Satosi; Takakuwa, Eiji; and Shimogawa, Toshiaki, 4,273,361, Cl. 280-805.000.
Takamizawa, Minoru; Okada, Fumio; Hara, Yasuaki; and Aoki, Hisashi, to Shin-Etsu Chemical Co., Ltd. Benzoin-bonded organopolysiloxanes and method for the preparation thereof. 4,273,907, Cl. 528-29.000.
Takamizawa, Minoru: *See—*
Yokokura, Shuichi; Horie, Yu; Takamizawa, Minoru; Inoue, Yoshio; and Yoshioka, Hiroshi, 4,273,834, Cl. 428-429.000.
Takara Co., Ltd.: *See—*
Inoue, Tsutomu, 4,272,918, Cl. 46-266.000.
Takayama, Satoshi: *See—*
Murata, Kosaku; Takayama, Satoshi; and Ieki, Mitsuru, 4,273,900, Cl. 525-444.000.
Takefuta, Hideyasu; Shinoda, Akira; and Shibauta, Teruyoshi, to Diesel Kiki Co., Ltd. Electromagnetic spring-wound clutch. 4,273,226, Cl. 192-35.000.
Takehara, Masahiro: *See—*
Nagashima, Tetsuya; Usuba, Yasunori; Ogawa, Takahisa; and Takehara, Masahiro, 4,273,684, Cl. 252-544.000.
Takei, Toshihiro; Kuwakado, Satosi; Takakuwa, Eiji; and Shimogawa, Toshiaki, to Nippon Soken, Inc. Seat belt system for vehicle. 4,273,361, Cl. 280-805.000.
Takemoto, Issei: *See—*
Watanabe, Takeshi; Sudo, Ryoichi; Shoji, Fusaji; Takemoto, Issei; and Yokono, Hitoshi, 4,273,420, Cl. 350-341.000.
Takeuchi, Keizo; Iwai, Yoshio; Yamanaka, Tadashi; and Miura, Tatsuo, to Nippondenso Co., Ltd. Method of manufacturing mechanical parts from metal scrap. 4,272,877, Cl. 29-403.200.
Takeuchi, Shinziro; Kikuchi, Toshiro; Mitsumoto, Norio; Takahashi, Toyoki; Hayashi, Hidekatsu; and Ichioka, Satoshi, to Mishima Kosan Co., Ltd. Coordinate reading device. 4,273,954, Cl. 178-19.000.
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Tamamura, Hideo: *See—*
Matsuda, Mutsuhide; Tamamura, Hideo; Taguchi, Tetsuya; Okino, Tadashi; and Yazaki, Mutsunobu, 4,273,432, Cl. 354-145.000.
Tamaru, Munetaka: *See—*
Kume, Kazunari; Watanabe, Minoru; Ohno, Hideshi; and Tamaru, Munetaka, 4,274,153, Cl. 368-80.000.
Tamulevich, Thomas W., to Epoxy Technology Inc. Face finishing tool for fiber optic communication cable. 4,272,926, Cl. 51-216.00R.
Tamura, Eiji; and Nakamura, Takashi, to Sony Corporation. Memory-type automatic adjustment system. 4,274,107, Cl. 358-29.000.
Tamura, Zensuke: *See—*
Kimura, Shoichi; Takahashi, Toshihiko; and Tamura, Zensuke, 4,273,749, Cl. 423-231.000.
Tanaka, Akira, to American Safety Equipment Corporaion. Dual latching mechanism for a flexible deck lid. 4,273,368, Cl. 292-53.000.
Tanaka, Fujio: *See—*
Nagasawa, Kohtaro; Ochi, Hideo; Tanaka, Fujio; and Shibata, Yumi, 4,273,858, Cl. 430-296.000.
Tanaka, Nobuyasu; Nakajima, Kazuhira; Yamaguchi, Kaoru; Hara, Shinji; Murata, Morihiro; Nakazima, Tetuyosi; Matuo, Hirosi; Onishi, Akura; and Hirano, Kazuo, to Fuji Electric Co., Ltd. Automatic vending machine. 4,273,253, Cl. 221-75.000.
Tanaka, Shuhei: *See—*
Ohba, Shinya; Tanaka, Shuhei; Kubo, Masaharu; Ando, Haruhisa; Yamashita, Yataro; Hanamura, Shoji; Aoki, Masakazu; and Nakai, Masaaki, 4,274,113, Cl. 358-212.000.

Tanaka, Shunroku; Inoue, Jun; Yukimachi, Katsurou; and Minamino, Keiichi, to Osaka Gas Kabushiki Kaisha. Solar heat utilized air-conditioning system. 4,273,184, Cl. 165-59.000.

Tani, Shoji; and Nishio, Kenji, to New Japan Chemical Company, Ltd. Process for preparing 3,4,5,6-tetrahydrophthalic anhydrides or derivatives thereof. 4,273,719, Cl. 260-346.300.

Taniguchi, Masatosi: *See*—
Kamiya, Hiroyuki; Watanabe, Seiji; Taniguchi, Masatosi; Okawara, Tomokichi; Aki, Fumitake; and Wachi, Yasuyuki, 4,274,021, Cl. 310-54.000.

Tanimura, Ken: *See*—
Onodera, Toshio; and Tanimura, Ken, 4,274,136, Cl. 363-68.000.

Tansill, Horace A. Resin-coated fiber mass containing catalyst-filled hollow fibers. 4,272,898, Cl. 36-44.000.

Tanso, Shiro: *See*—
Machi, Sueo; Ishigaki, Isao; Sugo, Takanobu; Murata, Kazuo; Tanso, Shiro; and Senoo, Keizi, 4,273,840, Cl. 429-144.000.

Tate, Ronald D.: *See*—
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Tatina, Richard A., to Portec, Inc. Winch and chain attachment assembly. 4,273,486, Cl. 410-103.000.

Tatsuno, Kimio: *See*—
Kataoka, Keiji; Tatsuno, Kimio; and Saito, Susumu, 4,274,101, Cl. 346-108.000.

Taylor, Clyde O.: *See*—
Cleveland, Gary L.; and Taylor, Clyde O., 4,273,081, Cl. 123-41.080.

Teche, Andre: *See*—
Martel, Jacques; Tessier, Jean; Teche, Andre; and Demoute, Jean-Pierre, 4,273,727, Cl. 260-465.00F.

Technicon Instruments Corporation: *See*—
Judge, John F. X., 4,274,093, Cl. 340-712.000.

Technische Gerate -u. Entwicklungsgesellschaft m.b.H: *See*—
Jordan, Heinz, 4,273,302, Cl. 244-23.00C.

Tecumseh Products Company: *See*—
Gannaway, Edwin L., 4,273,519, Cl. 417-273.000.

Teijin Chemicals, Ltd.: *See*—
Saiki, Noritsugu; and Kaneko, Takashi, 4,273,899, Cl. 525-439.000.

Teijin Limited: *See*—
Saiki, Noritsugu; and Kaneko, Takashi, 4,273,899, Cl. 525-439.000.

Teledyne Industries, Inc.: *See*—
Swanson, Gerald T.; and Trenary, John, 4,273,142, Cl. 131-339.000.

Telescope Folding Furniture Co., Inc., The: *See*—
Borichevsky, Donald J., 4,273,379, Cl. 297-56.000.

Telle, Helmut: *See*—
Brinkmann, Uwe; Telle, Helmut; Raue, Roderich; and Schellhammer, Carl-Wolfgang, 4,274,062, Cl. 331-94.50L.

Ten Eyck, Richard E.: *See*—
Smith, Lloyd T.; Bartholomew, Alan E.; Fee, Robert W.; Meister, Michael L.; Robbins, Richard J.; and Ten Eyck, Richard E., 4,273,173, Cl. 81-177.00M.

Tenneco Chemicals, Inc.: *See*—
Feldman, Martin L.; and De Groff, James T., 4,273,701, Cl. 260-40.00R.

Tennyson, Mark R.: *See*—
Padgett, Clarence W.; Marmet, Melvin L.; and Tennyson, Mark R., 4,274,147, Cl. 365-189.000.

Teplov, Sergei V.: *See*—
Aladiev, Ivan T.; Dzhamardzhashvili, Vazha A.; Dikhashidze, Manana A.; Teplov, Sergei V.; and Tskhvirashvili, David G., 4,274,019, Cl. 310-11.000.

Teragaki, Takeshi; Ohno, Yasuya; and Yokoyama, Etsuso, to T .C. - Citizen Co., Ltd. Display unit. 4,273,396, Cl. 312-223.000.

Teranishi, Katsuya: *See*—
Saito, Cyuichi; and Teranishi, Katsuya, 4,273,232, Cl. 198-335.000.

Terreri, Anthony N. Oil-filled cable pothead with venting means and tool therefor. 4,273,951, Cl. 174-11.0BH.

Terry, Melvin D. Roll handling device. 4,273,501, Cl. 414-680.000.

Tertishnikov, Anatoly S.; Platunov, Boris P.; Novikov, Alexei V.; Gordeev, Nikolai A.; Belebashev, Eduard K.; Lovtsov, Dmitry P.; Korytov, Vladimir A.; and Ignatiev, Jury P. Process and apparatus for continuous casting of metal in electromagnetic field. 4,273,180, Cl. 164-49.000.

Teshima, Hiroshi: *See*—
Shima, Ichiji; Yamamoto, Tatsuo; Yoshibayashi, Shigeru; Teshima, Hiroshi; Hizume, Akio; Iki, Tetsuo; Yamamoto, Takashi; Kanamori, Kyozo; and Noguchi, Kenzo, 4,272,992, Cl. 73-650.000.

Tessier, Jean: *See*—
Martel, Jacques; Tessier, Jean; Teche, Andre; and Demoute, Jean-Pierre, 4,273,727, Cl. 260-465.00F.

Texaco Development Corp.: *See*—
Dominguez, Richard J. G.; and Rice, Doris M., 4,273,885, Cl. 521-115.000.

Texaco Inc.: *See*—
Arnold, Dan M.; and Pitts, Robert W., Jr., 4,272,982, Cl. 73-19.000.
Barber, Everett M.; Muenger, James R.; and Alexander, David L., 4,273,743, Cl. 422-148.000.
Dominguez, Richard J. G., 4,273,884, Cl. 521-114.000.
Gunn, Kenneth M., 4,273,164, Cl. 141-7.000.
Hammond, Kenneth G.; and Chafetz, Harry, 4,273,663, Cl. 252-34.000.
Saadeh, Fuad T.; and Fontaine, Marc F., 4,273,192, Cl. 166-312.000.
Satter, Abdus; Widmyer, Richard H.; Shum, Yick M.; and Howard, Curtis E., 4,273,187, Cl. 166-250.000.

Texas Instruments Incorporated: *See*—
Summers, Tommy L.; and Yenawine, David L., 4,273,398, Cl. 316-20.000.

Textron Inc.: *See*—
Mansheim, James W.; and Martz, William M., 4,273,458, Cl. 401-109.000.

Tezuka, Haruya: *See*—
Ohno, Shigeru; Tezuka, Haruya; and Ishihara, Toshinobu, 4,273,944, Cl. 568-396.000.

Theodore Sweeney & Company: *See*—
Sweeney, Theodore J.; and Haviland, John G., 4,273,827, Cl. 428-307.000.

Thiene, Paul G., to Surgical Mechanical Research Corp. Proximity instant-on switch for medical and dental instruments. 4,274,070, Cl. 335-205.000.

Thiokol Corporation: *See*—
Lamere, Garland C.; Inman, Frank S.; and Mitchell, Ronald B., 4,272,956, Cl. 60-242.000.

Tholen, Paul, to Klockner-Humboldt-Deutz Aktiengesellschaft. Cooling system for vehicle drive. 4,273,082, Cl. 123-41.310.

Thoma, Kurt; and Ulrich, Urban, to BBC Brown, Boveri & Company, Limited. Device for holding a disc-shaped semiconductor element. 4,273,185, Cl. 165-80.00B.

Thomas, Arend J. Electric heating apparatus for heat-treating pharmaceuticals. 4,273,992, Cl. 219-521.000.

Thomas & Betts Corporation: *See*—
Law, Joseph P., 4,273,405, Cl. 339-94.00R.

Thomas, Daniel C.: *See*—
Muzyczko, Thaddeus M.; and Thomas, Daniel C., 4,273,851, Cl. 430-175.000.

Thomas, James L.: *See*—
Cummins, Richard W.; Fuchs, Robert J.; and Thomas, James L., 4,273,687, Cl. 260-17.200.

Thomerson, Clarence; and Jackson, Jay W., to Regal Tool & Rubber Co., Inc. Shock absorbing column. 4,273,473, Cl. 405-212.000.

Thompson, Carl, Jr., to Gould Inc. Undervoltage protector for manual motor controller. 4,274,068, Cl. 335-20.000.

Thompson, Charles L.: *See*—
Rapson, William J., Jr.; Delatorre, Leroy C.; and Thompson, Charles L., 4,272,985, Cl. 73-49.200.

Thompson, Craig B.: *See*—
Hanson, Sheldon H.; Thompson, Craig B.; and Olson, James E., 4,273,791, Cl. 426-439.000.

Thompson, David E.; Yao, Shi-Kay; August, Rudolf R.; and Anderson, Dean B., to Rockwell International Corporation. Interferometer gyroscope formed on a single plane optical waveguide. 4,273,445, Cl. 356-350.000.

Thompson, David L.: *See*—
Hartlaub, Jerome T.; Thompson, David L.; and McDonald, Ray S., 4,273,132, Cl. 128-419.0PT.

Thompson, M. Leonard: *See*—
Raupp, Arthur J., Jr.; Gerasin, Michael N.; and Thompson, M. Leonard, 4,273,479, Cl. 407-113.000.

Thompson, Mortimer S. Bottles with attached handles and a method of forming the same. 4,273,246, Cl. 215-100.00A.

Thompson, Robert M.: *See*—
Kohn, Edward M.; Nickol, Stephen L.; and Thompson, Robert M., 4,273,898, Cl. 525-432.000.

Thoms, Richard W., to Parklawn Associates, Inc. Method and apparatus for controlling and conserving energy in an absorption refrigeration system. 4,272,965, Cl. 62-104.000.

Thomson, Robert P.; and Robertson, James R., to Imperial Chemical Industries Limited. Industrial manipulator for placing articles in close proximity to adjacent articles. 4,273,506, Cl. 414-735.000.

Thorne, William D.: *See*—
Sebrosky, Robert A.; and Thorne, William D., 4,273,040, Cl. 101-93.040.

Thornton, Donald C.: *See*—
Laitinen, Herbert A.; and Thornton, Donald C., 4,273,624, Cl. 204-23.000.

Three Bond Co., Ltd.: *See*—
Higuchi, Senji, 4,273,835, Cl. 428-446.000.

Thummler, Ursus: *See*—
Lehr, Klaus; Heymer, Gero; Stephan, Hans-Werner; and Thummler, Ursus, 4,273,752, Cl. 423-322.000.

Thunselle, James: *See*—
Wolford, Byron F.; Rose, John F.; and Thunselle, James, 4,273,976, Cl. 200-83.00L.

Thurber, Robert E.: *See*—
Phipps, Joe; Thurber, Robert E.; and Prengaman, Richard J., 4,274,095, Cl. 343-7.00A.

Thurston, Jay D.; and Spector, George. Flexible form fitting glove. 4,272,849, Cl. 2-16.000.

Thwaites, John A.; and Ferrara, Ronald A., to Contran Conveyors & Systems, Inc. Zero pressure accumulator and braking apparatus therefor. 4,273,239, Cl. 198-781.000.

Tietjens, Eduard W., to U.S. Philips Corporation. Shaving apparatus. 4,272,884, Cl. 30-43.600.

Tiger, Howard L. Volumetric dispenser. 4,273,271, Cl. 222-454.000.

Tilkens, Lucien, to Yamaha Hatsudoki Kabushiki Kaisha. Oleo dampers having variable orifices. 4,273,220, Cl. 188-282.000.

Tinnes, Bernhard, to Metacon AG. Slide closure for the tapping channel of a molten metal container. 4,273,315, Cl. 266-236.000.

Tobita, Katsumi: *See*—
Yoshisato, Akiyuki; and Tobita, Katsumi, 4,274,066, Cl. 331-116.00R.

Todd, Robert; and Haas, Frank J., to Burroughs Corporation. Apparatus and method for dynamic font switching. 4,274,079, Cl. 340-146.3FT.
Todokoro, Hideo: *See—*
Fukuhara, Satoru; Todokoro, Hideo; and Sakitani, Yoshio, 4,274,035, Cl. 315-357.000.
Toki, Kaoru: *See—*
Ito, Susumu; and Toki, Kaoru, 4,274,053, Cl. 324-174.000.
Tokico Ltd.: *See—*
Ito, Hiroshi, 4,273,219, Cl. 188-256.000.
Tokuda, Hiroatsu; and Furuhashi, Toshio, to Hitachi, Ltd. Method and apparatus for controlling an internal combustion engine, particularly the starting up of the engine. 4,274,141, Cl. 364-431.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Honma, Hiroshi, 4,273,452, Cl. 400-124.000.
Shimokawa, Yoshiyuki, 4,274,138, Cl. 364-200.000.
Tomita, Yutaka, 4,274,002, Cl. 250-366.000.
Yamamura, Toshio; Muraki, Takeshi; and Miura, Heihachi, 4,274,005, Cl. 250-445.00T.
Tolbert, William R.; Hitt, Mary M.; and Feder, Joseph, to Monsanto Company. Production of angiogenic factor by cell culture. 4,273,871, Cl. 435-41.000.
Tollette, Henry B., to Custom Made Packaging Inc. Foam based structure. 4,273,816, Cl. 428-35.000.
Tolman, Radon: *See—*
Phillips, William R., Jr.; Tate, Ronald D.; and Tolman, Radon, 4,273,312, Cl. 266-44.000.
Tom McGuane Industries, Inc.: *See—*
Ludwig, George C., 4,273,157, Cl. 137-887.000.
Tomioka, Kentaro; Watanabe, Kazuhiro; and Iwata, Eiji, to G-C Dental Industrial Corp. Dental silicone compositions and the method of using the same. 4,273,902, Cl. 525-478.000.
Tomita, Masao, to Matsushita Electric Industrial Co., Ltd. Digital record level setting system. 4,274,117, Cl. 360-68.000.
Tomita, Yoshifumi: *See—*
Nonogaki, Saburo; Morishita, Hajime; Hashimoto, Michiaki; Manabe, Toshikatsu; Tomita, Yoshifumi; and Nishizawa, Masahiro, 4,273,842, Cl. 430-25.000.
Tomita, Yutaka, to Tokyo Shibaura Denki Kabushiki Kaisha. Scintillation camera. 4,274,002, Cl. 250-366.000.
Tomlinson, Lenore E. Protective insert for use with soft-sided luggage. 4,273,223, Cl. 190-41.00C.
Tomoeda, Eiichi. Apparatus for identifying moving objects. 4,274,083, Cl. 340-171.00R.
Tompkins, John C., to Kerr-McGee Coal Corporation. Process for use in degasification of subterranean mineral deposits. 4,273,193, Cl. 166-314.000.
Tomra Systems A/S: *See—*
Rustand, Willy, 4,273,235, Cl. 198-372.000.
Tool, Eduard A.: *See—*
Boriskin, Ivan K.; Bragin, Jury S.; Bykov, Mikhail S.; Gubanov, Valentin I.; Ivanov, Vladlen M.; Tool, Eduard A.; Bazilevich, Sergei V., deceased; Bazilevich, Tatyana N., administrator; Sergeev, Vitaly A., deceased; Sergeeva, Valentina I., administrator; and Sergeeva, Elena V., administrator, 4,273,298, Cl. 241-189.00R.
Toray Silicone Company, Ltd.: *See—*
Sumimura, Shinichi; and Shimuzu, Koji, 4,273,697, Cl. 260-37.0SB.
Torrey, Arthur L.: *See—*
Huggins, Raymond W.; Burnham, Paul W.; and Torrey, Arthur L., 4,273,069, Cl. 118-658.000.
Toshin Kogyo Co., Ltd.: *See—*
Machida, Saneto, 4,273,042, Cl. 101-123.000.
Towmotor Corporation: *See—*
Brown, Vaikai K.; Bjorksten, Thorolf R.; and Walter, Llewellyn L., 4,273,224, Cl. 192-4.00A.
Toyama, Masamichi: *See—*
Iwama, Hideto; Toyama, Masamichi; Shimazaki, Mamoru; and Ichiyanagi, Toshikazu, 4,273,426, Cl. 352-169.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Kobayashi, Fumiaki, 4,273,375, Cl. 296-65.00R.
Ogawa, Masahiro; and Mizobe, Tugio, 4,273,983, Cl. 219-93.000.
Onaka, Hidemi, 4,273,092, Cl. 123-568.000.
Tracy, Chester E.; and Kern, Werner, to RCA Corporation. Bulk glass having improved properties. 4,273,828, Cl. 428-336.000.
Trahan, Karl W., Sr.; and Smith, Timothy S., to Kar Fabricators, Inc. Basin. 4,273,466, Cl. 404-4.000.
Traub, Alan C.: *See—*
Dostoomian, A. S.; and Traub, Alan C., 4,274,154, Cl. 368-82.000.
Trefney, Ralph P., to Bird Electronic Corporation. Monitor for RF transmitter. 4,274,156, Cl. 455-115.000.
Tregurtha, Steven J., to Lucas Industries Limited. Electrical switch having rotatable and pivotable lever. 4,273,971, Cl. 200-4.000.
Trenary, John: *See—*
Swanson, Gerald T.; and Trenary, John, 4,273,142, Cl. 131-339.000.
Tri-Tech, Inc.: *See—*
Haydon, Arthur W.; and Dean, John J., 4,274,026, Cl. 310-254.000.
Tricoles, Gus P.; and Rope, Eugene L., to General Dynamics Corporation, Electronics Division. Three-dimensional measurement of radiant energy scattering characteristics with a turntable-type scanning interferometer. 4,274,048, Cl. 324-58.00R.
Trigg, Donald L.; and Portolan, Richard V. Flag pin attachment including ball distance measuring line and turf repair tool. 4,273,329, Cl. 273-32.00B.
Trilli, Pasquale. Combination laminator and separator. 4,273,606, Cl. 156-388.000.
Troebel, Werner; and Habedank, Klaus-Dieter, to Siemens Aktiengesellschaft. Locking arrangement for electric circuit breakers. 4,274,069, Cl. 335-21.000.
Trutzschler GmbH & Co. KG: *See—*
Vollrath, Ulrich, 4,272,866, Cl. 19-150.000.
TRW Inc.: *See—*
Jones, Robert J., 4,273,916, Cl. 528-117.000.
Tskhvirashvili, David G.: *See—*
Aladiev, Ivan T.; Dzhamardzhashvili, Vazha A.; Dikhashidze, Manana A.; Teplov, Sergei V.; and Tskhvirashvili, David G., 4,274,019, Cl. 310-11.000.
Tsui, Kwok W., to Arco Industries Ltd. Toy medical monitor unit. 4,272,909, Cl. 46-39.000.
Tsukaya, Takashi, to Olympus Optical Co., Ltd. Endoscope with bend angle control. 4,273,111, Cl. 128-6.000.
Tsutaya, Tadao: *See—*
Fujita, Isao; Imanishi, Nobuyuki; Tsutaya, Tadao; Watanabe, Ryo; and Kawai, Takao, 4,273,577, Cl. 75-41.000.
Tsutsui, Ken; Sasano, Akira; Nakano, Toshio; Matsumaru, Haruo; and Maruyama, Eiichi, to Hitachi, Ltd.; and Hitachi Denshi Kabushiki Kaisha. Method of producing material patterns by evaporating material through a perforated mask having a reinforcing bridge. 4,273,812, Cl. 427-248.100.
Tuda, Koji; Nagashima, Hironobu; and Marui, Masatoshi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Larynx stroboscope device. 4,273,959, Cl. 179-1.0SC.
Turk, Gunter: *See—*
Nauroth, Peter; Esch, Heinz; Kuhlmann, Robert; Bode, Rudolf; Reisert, Arthur; Buhler, Harald; and Turk, Gunter, 4,273,589, Cl. 106-308.00Q.
Turner, S. Richard: *See—*
Pai, Damodar M.; Turner, S. Richard; Yanus, John F.; Renfer, Dale S.; and Stolka, Milan, 4,273,846, Cl. 430-59.000.
Turnwald, Ernst; Asztalos, Stefan; and Rosenmeier, Rudolf, to Linde Aktiengesellschaft. Valves and operating system for expansion machines. 4,273,028, Cl. 91-275.000.
Turova, Lidia S.: *See—*
Pravoverov, Nikolai L.; Nazyrov, Ravil N.; Grigorov, Sergei S.; and Turova, Lidia S., 4,273,137, Cl. 128-784.000.
Tyran, Leo W., to Du Pont de Nemours, E. I., and Company. Flake silver powders with chemisorbed monolayer of dispersant. 4,273,583, Cl. 75-251.000.
Uchida, Shigeru: *See—*
Shimatake, Hirokazu; Natsume, Kenzo; Kojima, Takeshi; Ogawa, Shuichi; Nara, Ryuichi; Uchida, Shigeru; and Takagishi, Haruyoshi, 4,273,504, Cl. 414-728.000.
Ueda, Makoto: *See—*
Ikenishi, Masataka; Miyazaki, Joichi; Kushida, Shozo; Nakanishi, Hiromasa; Ueda, Makoto; and Shida, Masaharu, 4,274,150, Cl. 368-185.000.
Ueno, Mitsuo, to Nissan Motor Company, Limited. Axle construction for four wheel drive vehicles or the like. 4,273,460, Cl. 403-1.000.
Uesugi, Kyozo, to Minolta Camera Kabushiki Kaisha. Zoom lens barrel assembly for constant magnification. 4,273,423, Cl. 350-429.000.
Uihlein, Michael, to Hoechst Aktiengesellschaft. Microchromatographic system for medicament intake control. 4,273,653, Cl. 210-198.300.
Ulrich, Urban: *See—*
Thoma, Kurt; and Ulrich, Urban, 4,273,185, Cl. 165-80.00B.
UMC Industries, Inc.: *See—*
Koeneker, William V.; and Newkirk, Franklin D., 4,273,259, Cl. 222-108.000.
Unigovsky, Mikhail R.: *See—*
Paton, Boris E.; Scherbina, Boris E.; Lebedev, Vladimir K.; Ivantsov, Oleg M.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; Galian, Boris A.; Unigovsky, Mikhail R.; and Serafin, Orest M., 4,273,985, Cl. 219-101.000.
Union Carbide Corporation: *See—*
Carder, Charles H.; and Koleske, Joseph V., 4,273,633, Cl. 204-159.170.
D'Angelo, Paul F.; and Metzler, Richard B., 4,273,584, Cl. 106-3.000.
Fiato, Rocco A.; and Pruett, Roy L., 4,273,936, Cl. 562-606.000.
Gum, Mary L.; and Kearns, Nancye D., 4,273,937, Cl. 564-2.000.
Kamp, Ewald A., 4,273,550, Cl. 493-240.000.
Pepe, Enrico J.; and Marsden, James G., 4,273,694, Cl. 260-29.20E.
Uniroyal, Inc.: *See—*
Nybakken, George H., 4,273,177, Cl. 152-360.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State in Her Britannic Majesty's Government of the: *See—*
Bowditch, Malcolm R., 4,273,598, Cl. 156-94.000.
U.S. Emission Systems, Inc.: *See—*
Waltrip, Owen R., 4,272,958, Cl. 60-309.000.
United States of America
Agriculture: *See—*
Dawson, Jean H., 4,272,920, Cl. 47-58.000.
Hicks, Kevin B., 4,273,922, Cl. 536-1.000.
Kochansky, Jan P.; Feldmesser, Julius; and Robbins, William E., 4,273,768, Cl. 424-222.000.
Koritala, Sambasivarao, 4,273,722, Cl. 260-409.000.
Air Force: *See—*
Allinikov, Sidney, 4,273,671, Cl. 252-301.190.
Altoz, Frank E.; and Winn, William H., 4,273,183, Cl. 165-32.000.
Garscadden, Alan; Bletzinger, Peter; Hasinger, Siegfried H.; Olson, Robert A.; and Sarka, Benjamin, 4,274,065, Cl. 331-94.50G.

Geary, Joseph M., 4,273,419, Cl. 350-320.000.
Glass, Howard L.; and Elliott, Michael T., 4,273,610, Cl. 156-624.000.
Pohle, Richard H., 4,273,446, Cl. 356-354.000.
Renau, Jacques; Curtis, James W.; Nicholson, Donald S.; and Hennessey, Frank L., 4,274,098, Cl. 343-781.0CA.
Stoll, Harold M., 4,274,049, Cl. 324-77.00K.
Vonusa, Richard S.; and Woodard, Jeffrey P., 4,274,092, Cl. 340-705.000.
Walter, Albert F., 4,273,026, Cl. 89-37.00R.
Wick, Ralph E., 4,273,536, Cl. 434-14.000.

Army: *See—*
F'Geppert, Erwin, 4,272,998, Cl. 74-99.00R.
Gutierrez, William A.; and Pollard, John H., 4,273,596, Cl. 148-171.000.

National Aeronautics and Space Administration: *See—*
Clark, Keith H.; and Johnston, James D., 4,273,505, Cl. 414-735.000.
Rosser, Robert W.; Shalhoub, Ibrahim M.; and Kwong, Hanoi, 4,273,918, Cl. 528-310.000.
Sawyer, Ralph V., 4,274,038, Cl. 318-663.000.

Navy: *See—*
Aley, Michael H.; Bowen, James A.; and Glass, Cecil A., 4,273,048, Cl. 102-363.000.
Assard, Gerald L., 4,274,055, Cl. 328-14.000.
Krall, Albert D.; and Syeles, Albert M., 4,274,097, Cl. 343-719.000.
Phipps, Joe; Thurber, Robert E.; and Prengaman, Richard J., 4,274,095, Cl. 343-7.00A.
Pierpoint, William, 4,273,999, Cl. 250-205.000.
Porter, Roger S.; and Zachariades, Anagnostis E., 4,273,739, Cl. 264-211.000.

U.S. Philips Corporation: *See—*
Barre, Claude, 4,274,044, Cl. 320-21.000.
Giles, Terence G., 4,274,089, Cl. 340-572.000.
Tietjens, Eduard W., 4,272,884, Cl. 30-43.600.
Van de Leest, Renaat E.; Krijl, Gerrit; and Boonzajer Flaes, Ewoud A., 4,273,625, Cl. 204-56.00R.
Weistra, Marten P., 4,272,995, Cl. 73-861.090.

United States Trading International, Inc.: *See—*
De Long, Charles F., 4,273,833, Cl. 428-411.000.

United Technologies Corporation: *See—*
McComas, Charles C.; and Sokol, Larry S., 4,273,824, Cl. 428-256.000.
Paduch, Stanley R.; and Olson, Robert K., 4,273,150, Cl. 137-85.000.

United Turbine AB & Co., Kommanditbolag: *See—*
Kronogard, Sven-Olof, 4,272,954, Cl. 60-39.16R.

Unitika Ltd.: *See—*
Sugitachi, Akio; Takagi, Kunihiko; and Yabushita, Yasunori, 4,273,873, Cl. 435-180.000.

Universal Foods Corporation: *See—*
Bentzien, Len, 4,272,895, Cl. 34-10.000.

Universal Pioneer Corporation: *See—*
Kanamaru, Hitoshi, 4,273,998, Cl. 250-204.000.

University of Minnesota, The Regents of the: *See—*
Shapiro, Burton L., 4,273,869, Cl. 435-26.000.

Uno, Masahiro: *See—*
Watanabe, Atsuo; and Uno, Masahiro, 4,273,450, Cl. 356-433.000.

Upjohn Company, The: *See—*
Bundy, Gordon L., 4,273,716, Cl. 260-345.90P.
Manis, Jack J., 4,273,875, Cl. 435-253.000.
Sih, John C., 4,273,718, Cl. 260-346.220.

Uroshevich, Miroslav, to Alpha Solarco Inc. Solar energy receivers. 4,273,103, Cl. 126-438.000.

Uroshevich, Miroslav, to Alpha Solarco Inc. Solar energy collectors. 4,273,104, Cl. 126-439.000.

Uroshevich, Miroslav, to Alpha Solarco Inc. Solar energy collector. 4,273,105, Cl. 126-443.000.

USM Corporation: *See—*
Foley, Michael S.; and Pierson, Mark V., 4,273,393, Cl. 312-97.100.

Uson Corporation: *See—*
Rapson, William J., Jr.; Delatorre, Leroy C.; and Thompson, Charles L., 4,272,985, Cl. 73-49.200.

Usuba, Yasunori: *See—*
Nagashima, Tetsuya; Usuba, Yasunori; Ogawa, Takahisa; and Takehara, Masahiro, 4,273,684, Cl. 252-544.000.

Uzunoglu, Vasil, to Communications Satellite Corporation. Universal clock recovery network for QPSK modems. 4,274,067, Cl. 331-172.000.

Vadnais, Kenneth, to S & S Industries, Inc. Toy accessory. 4,273,275, Cl. 224-101.000.

Valeron Corporation, The: *See—*
Raupp, Arthur J., Jr.; Gerasin, Michael N.; and Thompson, M. Leonard, 4,273,479, Cl. 407-113.000.

Vandame, Philippe L., to Nordic Finance and Trade (Panama) Ltd. Inc. Electric circuit breaker. 4,273,975, Cl. 200-67.00C.

Van de Leest, Renaat E.; Krijl, Gerrit; and Boonzajer Flaes, Ewoud A., to U.S. Philips Corporation. Method of treating objects the surface of which consists of tin. 4,273,625, Cl. 204-56.00R.

van der Lely, Cornelis. Torque converter. 4,273,206, Cl. 180-6.00Z.

van de Wetering, Martinus B., to Interproduct B.V. Hoist clamp. 4,273,373, Cl. 294-101.000.

Vandlik, Robert P.: *See—*
Herdzina, Frank J.; and Vandlik, Robert P., 4,273,507, Cl. 414-750.000.

Vanhove, Jacques, to Mutexil. Method for manufacturing overshoes made of non-woven fabric. 4,272,859, Cl. 12-142.00K.

van't Hullenaar, Adrian, deceased (by Hullenaar, Christina Maria van't, executrix), to Westinghouse Canada Limited. Digital time-delay beamformer for sonar systems. 4,274,148, Cl. 367-122.000.

Vanzetti Infrared & Computer Systems, Inc.: *See—*
Dostoomian, A. S.; and Traub, Alan C., 4,274,154, Cl. 368-82.000.

Vapor Corporation: *See—*
Malinski, Richard F.; and Sikorcin, John, 4,273,307, Cl. 251-69.000.

Varadhachary, Seevaram N.: *See—*
Schmidle, Claude J.; and Varadhachary, Seevaram N., 4,273,819, Cl. 428-159.000.

Varian Associates, Inc.: *See—*
Nelson, Norvell J., 4,273,559, Cl. 23-232.00E.

Vartuli, James C.; and Zehner, Lee R., to Atlantic Richfield Company. Preparation of thallium promoted $VO(PO_3)_2$ oxidation catalyst. 4,273,677, Cl. 252-435.000.

Vassiliades, Anthony E., to Champion International Corporation. Microencapsulation process. 4,273,672, Cl. 252-316.000.

Veeder Industries Inc.: *See—*
Devanney, Raymond H., 4,273,995, Cl. 235-139.00R.
Fleischer, Donald W., 4,273,994, Cl. 235-92.00A.

Veloni, Bob R. Apparatus and method for extracting stuck ammunition cases from sizer dies. 4,273,024, Cl. 86-1.00R.

Vereinigte Baubeschlagfabriken, Gretsch & Co. GmbH: *See—*
Storandt, Ralf, 4,273,355, Cl. 280-614.000.

Verhecken, Andre: *See—*
Jaeken, Jan; Verhecken, Andre; Vetter, Hans; and Marx, Paul, 4,273,855, Cl. 430-242.000.

Vero Electronics GmbH: *See—*
Weiss, Harald, 4,273,952, Cl. 174-68.00B.

Vetter, Hans: *See—*
Jaeken, Jan; Verhecken, Andre; Vetter, Hans; and Marx, Paul, 4,273,855, Cl. 430-242.000.

Vianini, S.p.A.: *See—*
Marchesi, Sergio; and Fachin, Gino, 4,273,740, Cl. 264-228.000.

Victor Company of Japan, Limited: *See—*
Okabe, Yasuhisa, 4,274,059, Cl. 330-266.000.
Wada, Yoshiyo; Goto, Kunio; and Kinjo, Hisao, 4,273,967, Cl. 369-126.000.

Victor Electric Wire & Cable: *See—*
Blanche, Stephen A.; and Portrais, Lee, 4,273,409, Cl. 339-206.00P.

Villard, George: *See—*
Ponticello, Ignazio S.; Sniadoch, Henry J.; and Villard, George, 4,273,853, Cl. 430-213.000.

Villiger, Alois: *See—*
Boller, Arthur; Schadt, Martin; and Villiger, Alois, 4,273,929, Cl. 544-242.000.

Vinals, Joaquin F.: *See—*
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,273,662, Cl. 252-8.900.

Viri, Donald P.: *See—*
Iceland, William F.; and Viri, Donald P., 4,273,988, Cl. 219-137.0PS.

Viscovich, Paul W.; and Khemlani, Moti T., to Westinghouse Electric Corp. Pressure controller for dual purpose steam turbine power plant. 4,272,962, Cl. 60-648.000.

Visser, Teunis, to IHC Holland N.V. Shaft seal. 4,273,343, Cl. 277-53.000.

Vitobello, Vincenza: *See—*
Zaffaroni, Pasquale; Vitobello, Vincenza; and Gamalerio, Anna M., 4,273,872, Cl. 435-55.000.

Vittadini, Giorgio: *See—*
Garzia, Aldo; Vittadini, Giorgio; Bottazzi, Andrea; Pelagalli, Domenico; and Coccoli, Costantino, 4,273,931, Cl. 546-344.000.

Vivitar Corporation: *See—*
Praamsma, Michael F., 4,274,131, Cl. 362-355.000.
Shimojima, Masatoshi, 4,273,414, Cl. 350-429.000.

Vock, Manfred H.: *See—*
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,273,662, Cl. 252-8.900.

Voegele, Gunther; and Meyer, Gunter, to Robert Bosch GmbH. Filling apparatus for fluid media. 4,273,263, Cl. 222-148.000.

Vogel, Roger F.; Madgavkar, Ajay M.; and Swift, Harold E., to Gulf Research & Development Company. In situ combustion process for the recovery of liquid carbonaceous fuels from subterranean formations. 4,273,188, Cl. 166-256.000.

Vogel, Ronald F., to Bendix Corporation, The. Temperature compensated capacitance pressure transducer. 4,274,125, Cl. 361-283.000.

Vogelsberg, Dieter, to Siemens Aktiengesellschaft. Apparatus for the SZ twisting of power cable conductors with sector-shaped conductor cross section. 4,272,951, Cl. 57-293.000.

Voll, Horst, to Kugelfischer Georg Schafer & Co. Elastic mounting for high-speed rotor. 4,273,229, Cl. 192-105.0CF.

Vollrath, Ulrich, to Trutzschler GmbH & Co. KG. Web guiding device for a carding machine. 4,272,866, Cl. 19-150.000.

von Oertzen, Klaus: *See—*
Harms, Wolfgang; Jager, Horst; von Oertzen, Klaus; and Wunderlich, Klaus, 4,273,553, Cl. 8-549.000.

von Stering-Krugheim, Georg, to E.R.E. Europe Representation Establishment. Composition containing honey. 4,273,794, Cl. 426-590.000.

von Stetten, Otto; and Schmidt, Helmut, to Byk-Mallinckrodt Chemische Produkte GmbH. Insolubilized biochemical materials. 4,273,865, Cl. 435-7.000.

Vonusa, Richard S.; and Woodard, Jeffrey P., to United States of America, Air Force. Display system for microscopic optical instruments. 4,274,092, Cl. 340-705.000.
Voss, Houston F.; Plattner, Jacob; and Herrin, Thomas R., to Abbott Laboratories. Ligand analog-irreversible enzyme inhibitor conjugates and methods for use. 4,273,866, Cl. 435-7.000.
W. C. Heraeus GmbH: *See*—
Nesvadba, Paul; and Weigl, Gisela, 4,273,578, Cl. 75-83.000.
W. H. Brady Company: *See*—
Frame, Norman J., 4,274,028, Cl. 313-101.000.
W. H. Brine Company: *See*—
Rule, Robert J., 4,272,850, Cl. 2-24.000.
W. R. Grace & Co.: *See*—
Cogliano, Joseph A., 4,273,100, Cl. 126-433.000.
Pezzana, Francesco; and Quacquarella, Cesare, 4,273,549, Cl. 493-196.000.
Wood, Louis L.; and Larsen, Donald W., 4,273,913, Cl. 528-77.000.
WABCO Fahrzeugbremsen GmbH: *See*—
Liermann, Peter, 4,273,208, Cl. 180-179.000.
Wachi, Yasuyuki: *See*—
Higuchi, Shigeo; Iwasaki, Tsutomu; Sato, Koji; Hirama, Yukio; Watanabe, Masatoshi; Wachi, Yasuyuki; and Yasaka, Yasuhiro, 4,274,027, Cl. 310-269.000.
Kamiya, Hiroyuki; Watanabe, Seiji; Taniguchi, Masatosi; Okawara, Tomokichi; Aki, Fumitake; and Wachi, Yasuyuki, 4,274,021, Cl. 310-54.000.
Wada, Ryoichi; Senoo, Takanori; and Odagi, Kanji, to Matsushita Electric Industrial Co., Ltd. Apparatus for detecting recording and reproducing state. 4,274,115, Cl. 360-62.000.
Wada, Yoshiyo; Goto, Kunio; and Kinjo, Hisao, to Victor Company of Japan, Limited. Stylus for reproducing capacitive videodisc. 4,273,967, Cl. 369-126.000.
Wadsworth, Eric: *See*—
Savidge, David H.; and Wadsworth, Eric, 4,274,054, Cl. 324-225.000.
Wagensonner, Eduard: *See*—
Borowski, Kurt; Wagensonner, Eduard; and Cocron, Istvan, 4,273,428, Cl. 354-23.00D.
Wagner, Norman J.: *See*—
Sinha, Rabindra K.; Polinsky, Charles K.; Cifrulak, Stephen D., Sr.; and Wagner, Norman J., 4,273,751, Cl. 423-244.000.
Wahl, Alois; Elsner, Paul; and Born, Gerhard, to Seitz-Werke GmbH. Method and apparatus for handling bottles. 4,273,236, Cl. 198-432.000.
Wahl, Alois; and Elsner, Paul, to Seitz-Werke GmbH. Device for feeding containers, especially bottles, to processing machines, especially container cleaning machines. 4,273,237, Cl. 198-445.000.
Wahl, Edward F., III, to Occidental Petroleum Corporation. Process and system for recovery of working fluid for direct contact heat exchange. 4,272,960, Cl. 60-641.00D.
Wald, Roland, to Sandoz Ltd. 2-Aralkoxy-anthraquinone dyestuffs. 4,273,720, Cl. 260-374.000.
Waldvogel, Erwin; Bastian, Jean-Michel; and Schwarb, Gustav, to Sandoz Ltd. Anti-allergic anti-9,10-dihydro-4-(1-methyl-4-piperidylidene)-4H-benzo[4,5]cyclohepta[1,2-b]thiophen-10(9H)-one oxime. 4,273,780, Cl. 424-267.000.
Walker, Loren H.; and Cutler, John H., to General Electric Company. AC Motor drive system having clamped command error signal. 4,274,042, Cl. 318-803.000.
Walter, Albert F., to United States of America, Air Force. Gun alignment adjusting device. 4,273,026, Cl. 89-37.00R.
Walter, Bert, to Miles Laboratories, Inc. Color stable glucose test. 4,273,868, Cl. 435-14.000.
Walter, Llewellyn L.: *See*—
Brown, Vaikai K.; Bjorkstén, Thorolf R.; and Walter, Llewellyn L., 4,273,224, Cl. 192-4.00A.
Waltrip, Owen R., to U.S. Emission Systems, Inc. Anti-pollution treating device. 4,272,958, Cl. 60-309.000.
Walus, Aloysius N., to Du Pont de Nemours, E. I., and Company. Coating compositions of an alkyd-acrylic graft copolymer. 4,273,690, Cl. 260-22.0CB.
Wappler, Joachim H. R. Telescopic boom. 4,272,932, Cl. 52-118.000.
Warner-Lambert Company: *See*—
Ferraro, Frank A., 4,272,885, Cl. 30-47.000.
Warrix, John T., to Wolverine Toy Company. Game apparatus including projectile and pivotal targets. 4,273,341, Cl. 273-357.000.
Watanabe, Atsuo; and Uno, Masahiro, to Fuji Electric Co., Ltd. Photoacoustic spectrometer with analysis-signal enhancement. 4,273,450, Cl. 356-433.000.
Watanabe, Kazuhiro: *See*—
Shiiki, Zenya; and Watanabe, Kazuhiro, 4,273,675, Cl. 252-424.000.
Tomioka, Kentaro; Watanabe, Kazuhiro; and Iwata, Eiji, 4,273,902, Cl. 525-478.000.
Watanabe, Kimihiro: *See*—
Suhara, Yasuji; Ogawa, Kiyoshi; Yokose, Kazuteru; and Watanabe, Kimihiro, 4,273,765, Cl. 424-180.000.
Watanabe, Masatoshi: *See*—
Higuchi, Shigeo; Iwasaki, Tsutomu; Sato, Koji; Hirama, Yukio; Watanabe, Masatoshi; Wachi, Yasuyuki; and Yasaka, Yasuhiro, 4,274,027, Cl. 310-269.000.
Watanabe, Minoru: *See*—
Kume, Kazunari; Watanabe, Minoru; Ohno, Hideshi; and Tamaru, Munetaka, 4,274,153, Cl. 368-80.000.
Watanabe, Ryo: *See*—
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Watanabe, Seiji: *See*—
Kamiya, Hiroyuki; Watanabe, Seiji; Taniguchi, Masatosi; Okawara, Tomokichi; Aki, Fumitake; and Wachi, Yasuyuki, 4,274,021, Cl. 310-54.000.
Watanabe, Takeshi; Sudo, Ryoichi; Shoji, Fusaji; Takemoto, Issei; and Yokono, Hitoshi, to Hitachi, Ltd. Liquid crystal display device. 4,273,420, Cl. 350-341.000.
Waters, Frank E., to Chartered Industries of Singapore Private Limited. Fire-arms. 4,272,902, Cl. 42-25.000.
Watson, David M. Arrangements for constructing representations of parts of bodies. 4,274,140, Cl. 364-414.000.
Wavin B.V.: *See*—
de Lange, Tinus, 4,273,364, Cl. 285-197.000.
Wayne Automation Corporation: *See*—
Ginther, George E., Sr.; Johnson, A. David, Jr.; and Bachman, Joseph L., 4,273,322, Cl. 271-149.000.
Webb, Jimmy L.: *See*—
Ligon, Woodfin V., Jr.; and Webb, Jimmy L., 4,273,674, Cl. 252-408.000.
Wegener, Jack; and Johnson, Raynor A., to Wegener, Jack. Disposable air-bearing patient mover and a valve employed therein. 4,272,856, Cl. 5-81.00R.
Wegener, Robert L.: *See*—
Saam, John C.; and Wegener, Robert L., 4,273,634, Cl. 204-159.150.
Weidler, Jay B., to Brown & Root, Inc. Grouting of offshore jackets to distribute forces among the anchoring piles. 4,273,474, Cl. 405-225.000.
Weigl, Gisela: *See*—
Nesvadba, Paul; and Weigl, Gisela, 4,273,578, Cl. 75-83.000.
Weiler, Wolfgang, to MTU Motoren-und Turbinen-Union Munchen GmbH. Compressor rotor wheel and method of making same. 4,273,512, Cl. 416-188.000.
Weimer, Dan G., to Engineered Systems, Inc. Sequential card reader system. 4,273,996, Cl. 235-435.000.
Weingart, Oscar, to Structural Composites Industries, Inc. Method for the production of elongated resin impregnated filament composite structures. 4,273,601, Cl. 156-189.000.
Weinhold, Karl. Hose coupling. 4,272,871, Cl. 24-270.000.
Weiser, Martin: *See*—
Kotulla, Bernhard; Haas, Hans; Weiser, Martin; Forster, Rolf; Preis, Lothar; and Schmidt, Rudolf, 4,273,476, Cl. 405-258.000.
Weiss, Harald, to Vero Electronics GmbH. Bus bar for a card frame for circuit cards. 4,273,952, Cl. 174-68.00B.
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Hofer, Gerald; Konrath, Karl; Eheim, Franz; Weiss, Otmar; Schmitt, Edgar; Faupel, Werner; and Gotz, Edgar, 4,273,090, Cl. 123-502.000.
Stumpp, Gerhard; Greiner, Max; Weiss, Otmar; and Konrath, Karl, 4,273,091, Cl. 123-506.000.
Weissmann, Rita H. Safety jacket. 4,273,216, Cl. 182-3.000.
Weistra, Marten P., to U.S. Philips Corporation. Ionization flow meter. 4,272,995, Cl. 73-861.090.
Wenner, Hans. Apparatus for dispensing printed products. 4,273,256, Cl. 221-230.000.
Westinghouse Canada Limited: *See*—
van't Hullenaar, Adrian, deceased, 4,274,148, Cl. 367-122.000.
Westinghouse Electric Corp.: *See*—
Dorr, John A.; and Nomm, Matt, 4,273,212, Cl. 181-102.000.
Lahoda, Edward J.; and Dent, Thomas H., 4,273,076, Cl. 122-382.000.
Luck, Russell M.; and Gainer, Gordon C., 4,274,073, Cl. 337-248.000.
Phillips, David C.; Hickam, William M.; and Smith, James D. B., 4,272,988, Cl. 73-339.00R.
Rosa, John; and Gyugyi, Laszlo, 4,274,135, Cl. 363-68.000.
Smith, James D. B.; and Ott, Arthur W., 4,273,914, Cl. 528-89.000.
Viscovich, Paul W.; and Khemlani, Moti T., 4,272,962, Cl. 60-648.000.
Wetrok, Inc.: *See*—
Notta, Adolf; and Scovell, Ian A., 4,272,861, Cl. 15-320.000.
Whale, William E.: *See*—
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WHAM-0 Mfg. Co.: *See*—
Gillespie, Richard L.; and Geller, Douglas A., 4,273,418, Cl. 350-289.000.
Wheelock Signals, Inc.: *See*—
Haus, Rein, 4,274,084, Cl. 340-326.000.
Whitby, Clyde M., to Singer Company, The. Scanned beam color video generator. 4,274,109, Cl. 358-53.000.
White, Harold G.: *See*—
Aumann, James T.; and White, Harold G., 4,272,987, Cl. 73-153.000.
White, Jack H.; and FitzGerald, Joseph M., to Lear Siegler, Inc. Self-contained portable air-conditioning system. 4,272,967, Cl. 62-236.000.
White, James R.: *See*—
Audeh, Costandi A.; Heilweil, Israel J.; White, James R.; and Yan, Tsoung Y., 4,273,645, Cl. 208-323.000.
White, Ralph L., Jr.; and Portlock, David E., to Morton-Norwich Products, Inc. Converting enzyme inhibitor. 4,273,927, Cl. 544-32.000.
White, Thomas A., Jr.: *See*—
Erickson, John W.; Brown, F. Barton; and White, Thomas A., Jr., 4,273,509, Cl. 415-111.000.

Whiteman, Aharon E.: *See—*
Shoher, Itzhak; and Whiteman, Aharon E., 4,273,580, Cl. 75-165.000.
Whitney, Douglass G.; and Martin, John K., III. Self contained powered injection system. 4,273,122, Cl. 128-218.00A.
Wick, Ralph E., to United States of America, Air Force. Gun simulator system. 4,273,536, Cl. 434-14.000.
Wickenberg, Chester, to Seaquist Valve Co., Div. of Pittway. Fluid spray pump. 4,273,268, Cl. 222-321.000.
Widmyer, Richard H.: *See—*
Satter, Abdus; Widmyer, Richard H.; Shum, Yick M.; and Howard, Curtis E., 4,273,187, Cl. 166-250.000.
Wigby, Jon; Piatt, Ralph L.; and Anderson, James D. Methods and apparatus for making electrical connectors. 4,272,879, Cl. 29-566.200.
Wilhelm Roediger GmbH & Co.: *See—*
Roediger, Walter H., 4,273,732, Cl. 261-122.000.
Williams, Frank J., III, to General Electric Company. Method for making aromatic ether imides. 4,273,712, Cl. 260-326.00N.
Williams, Patrick Y. Folding wheelchair. 4,273,350, Cl. 280-242.0WC.
Willner, Nancy J. Unitized attachment device. 4,272,869, Cl. 24-3.00R.
Wilson, Phillip S.: *See—*
Mark, Victor; and Wilson, Phillip S., 4,273,692, Cl. 260-29.10R.
Mark, Victor; and Wilson, Phillip S., 4,273,942, Cl. 568-42.000.
Wimmenauer, Dirk: *See—*
Hermanns, Winfried; Lueg, Heinz; Blackert, Hanno; and Wimmenauer, Dirk, 4,274,076, Cl. 340-38.00L.
Windmoller & Holscher: *See—*
Bosse, Frank, 4,273,162, Cl. 139-13.00A.
Winer, Irving G., to J. M. Ney Company, The. Centrifugal casting machine. 4,273,181, Cl. 164-114.000.
Winn, William H.: *See—*
Altoz, Frank E.; and Winn, William H., 4,273,183, Cl. 165-32.000.
Winterhalter, Donald L.; and Perkey, Conrad G., to Ford Motor Company. Core assembly and the method of making and using such assembly. 4,273,182, Cl. 164-137.000.
Wittman, Leroy L.: *See—*
Jensen, Lyle B.; and Wittman, Leroy L., 4,273,244, Cl. 212-181.000.
Witzel, Bruce E.: *See—*
Grier, Nathaniel; Dybas, Richard A.; and Witzel, Bruce E., 4,273,781, Cl. 424-267.000.
Woellner-Werke: *See—*
Lederer, Gernot, 4,273,910, Cl. 528-48.000.
Wojtowicz, Walter; and Mursau, Gust. Flexible element rolling and handling apparatus. 4,273,300, Cl. 242-56.00R.
Woldenberg, Edwin: *See—*
Pump, Wichard; Becker, Wolfgang; and Woldenberg, Edwin, 4,273,880, Cl. 521-93.000.
Wolfe, Maynard F., to Jag International Sales Limited. Audioscope project. 4,273,956, Cl. 179-1.00H.
Wolfe, William H., to Harris Corporation. Impulse metering of local telephone switching offices via a DAMA DOMSAT communication system. 4,273,962, Cl. 179-7.10R.
Wolff, Per L., to Koninklijke Emballage Industrie Van Leer B.V. Process for preparation of foams by condensation reactions. 4,273,887, Cl. 521-188.000.
Wolford, Byron F.; Rose, John F.; and Thunselle, James, to Proximity Controls, Inc. Pressure responsive switch device. 4,273,976, Cl. 200-83.00L.
Wolverine Toy Company: *See—*
Warrix, John T., 4,273,341, Cl. 273-357.000.
Wood, Louis L.; and Larsen, Donald W., to W. R. Grace & Co. Isocyanate capped urethane-containing prepolymer prepared from polyols obtained from epihalohydrin. 4,273,913, Cl. 528-77.000.
Wood, William G.; and Pilznienski, John F., to Kolene Corp. Method and apparatus for prevention of clogging of exhaust systems. 4,273,591, Cl. 134-11.000.
Woodard, Jeffrey P.: *See—*
Vonusa, Richard S.; and Woodard, Jeffrey P., 4,274,092, Cl. 340-705.000.
Woodbury, James R., to McDonnell Douglas Corporation. Aircraft horizontal stabilizer drive. 4,273,006, Cl. 74-710.500.
Woodcock, Todd M.: *See—*
Luo, Zong S.; and Woodcock, Todd M., 4,273,039, Cl. 101-93.020.
Woodings Industrial Corporation: *See—*
Phillips, Paul S.; and Forsythe, Glenn, 4,273,202, Cl. 175-385.000.
Woolner, John H.; Gaslevic, Emeric; and Doorley, Richard B., to Portec, Inc. Spike driving apparatus. 4,273,052, Cl. 104-17.00R.
Workman, Nolan M.: *See—*
Baker, Eugene E.; Szarka, David D.; Davis, Odie R. S.; and Workman, Nolan M., 4,273,190, Cl. 166-278.000.
World Medical Marketing Corporation: *See—*
Hofstein, Steven R., 4,273,113, Cl. 128-25.00B.
Worley, Arthur C., to Exxon Research & Engineering Co. Cyclone support. 4,273,565, Cl. 55-343.000.
Wright, Ernest L.: *See—*
Cheng, Peter J.; Dockendorff, Jay D.; and Wright, Ernest L., 4,273,670, Cl. 252-301.10W.
Wu, E-ming: *See—*
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Feinberg, Irving; and Wu, Leon L., 4,274,124, Cl. 361-275.000.
Wunderlich, Klaus: *See—*
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Wyman, Ransome J.; Alshin, Richard A.; and Gilbert, Charles H., to Carefree Bicycle Tire Company. Non-pneumatic tire. 4,273,176, Cl. 152-327.000.
Xerox Corporation: *See—*
Huggins, Raymond W.; Burnham, Paul W.; and Torrey, Arthur L., 4,273,069, Cl. 118-658.000.
Pai, Damodar M.; Turner, S. Richard; Yanus, John F.; Renfer, Dale S.; and Stolka, Milan, 4,273,846, Cl. 430-59.000.
Pond, Stephen F., 4,274,100, Cl. 346-75.000.
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Yabushita, Yasunori: *See—*
Sugitachi, Akio; Takagi, Kunihiko; and Yabushita, Yasunori, 4,273,873, Cl. 435-180.000.
Yaeger, Michael. Game apparatus with notched game board. 4,273,338, Cl. 273-282.000.
Yamada, Kazunari: *See—*
Nomura, Nobutaka; Kido, Hiroshi; and Yamada, Kazunari, 4,274,081, Cl. 340-153.000.
Yamada, Yasushi; Ozawa, Hiroshi; Gomi, Masae; and Nomura, Hideshiro, to Nippon Kayaku Kabushiki Kaisha. Azo compounds. 4,273,555, Cl. 8-673.000.
Yamada, Yasuyuki: *See—*
Akashi, Goro; Yamada, Yasuyuki; Fujiyama, Masaaki; and Yamaguchi, Nobutaka, 4,273,797, Cl. 427-10.000.
Yamaguchi, Kaoru: *See—*
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Yamaguchi, Nobutaka: *See—*
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Yamaha Hatsudoki Kabushiki Kaisha: *See—*
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Yamamoto Electric Industrial Co., Ltd.: *See—*
Soeda, Katsuji, 4,274,037, Cl. 318-331.000.
Yamamoto, Hajime; and Yoshikawa, Shogo, to Kabushiki Kaisha Morita Seisakusho. Device for preventing tooth decay by laser beam irradiation and method of preventing tooth decay by use of the same. 4,273,535, Cl. 433-216.000.
Yamamoto, Takashi: *See—*
Shima, Ichiji; Yamamoto, Tatsuo; Yoshibayashi, Shigeru; Teshima, Hiroshi; Hizume, Akio; Iki, Tetsuo; Yamamoto, Takashi; Kanamori, Kyozo; and Noguchi, Kenzo, 4,272,992, Cl. 73-650.000.
Yamamoto, Takaya; Sakai, Kazuo; and Akiba, Shigeyuki, to Kokusai Denshin Denwa Kabushiki Kaisha. Avalanche photodiode with semiconductor hetero structure. 4,274,103, Cl. 357-13.000.
Yamamoto, Tatsuo: *See—*
Shima, Ichiji; Yamamoto, Tatsuo; Yoshibayashi, Shigeru; Teshima, Hiroshi; Hizume, Akio; Iki, Tetsuo; Yamamoto, Takashi; Kanamori, Kyozo; and Noguchi, Kenzo, 4,272,992, Cl. 73-650.000.
Yamamura, Toshio; Muraki, Takeshi; and Miura, Heihachi, to Tokyo Shibaura Denki Kabushiki Kaisha. X-ray apparatus for computed tomography scanner. 4,274,005, Cl. 250-445.00T.
Yamanaka, Tadashi: *See—*
Takeuchi, Keizo; Iwai, Yoshio; Yamanaka, Tadashi; and Miura, Tatsuo, 4,272,877, Cl. 29-403.200.
Yamane, Ken, to Nissan Motor Company, Limited. Diaphragm breakage condition detecting device for a pressure control device. 4,272,959, Cl. 60-602.000.
Yamashita, Akira: *See—*
Sugie, Hiromichi; Akado, Hajime; and Yamashita, Akira, 4,273,564, Cl. 55-267.000.
Yamashita, Hiroshi; Iwahana, Takehiko; and Fujiwara, Shunsuke, to Japanese National Railways. Vehicle vibration damping method in the induced repulsion type magnetically suspended railway vehicle. 4,273,054, Cl. 104-281.000.
Yamashita, Yataro: *See—*
Ohba, Shinya; Tanaka, Shuhei; Kubo, Masaharu; Ando, Haruhisa; Yamashita, Yataro; Hanamura, Shoji; Aoki, Masakazu; and Nakai, Masaaki, 4,274,113, Cl. 358-212.000.
Yamazaki, Noboru; and Morimoto, Yoshio, to Mitsui Toatsu Chemicals, Incorporated. Thermosetting resin compositions and the cured products thereof. 4,273,889, Cl. 525-109.000.
Yan, Tsoung Y.: *See—*
Audeh, Costandi A.; Heilweil, Israel J.; White, James R.; and Yan, Tsoung Y., 4,273,645, Cl. 208-323.000.
Yanagawa, Mikio, to Casio Computer Co., Ltd. Calendar data display device for an electronic device. 4,274,146, Cl. 364-705.000.
Yano, Makoto: *See—*
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Yano, Yasuhiro: *See—*
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Kobayashi, Hajime; Yano, Yasuhiro; and Endo, Ichiro, 4,273,845, Cl. 430-48.000.
Yanus, John F.: *See—*
Pai, Damodar M.; Turner, S. Richard; Yanus, John F.; Renfer, Dale S.; and Stolka, Milan, 4,273,846, Cl. 430-59.000.
Yao, Shi-Kay: *See—*
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Yasaka, Yasuhiro: *See*—
Higuchi, Shigeo; Iwasaki, Tsutomu; Sato, Koji; Hirama, Yukio; Watanabe, Masatoshi; Wachi, Yasuyuki; and Yasaka, Yasuhiro, 4,274,027, Cl. 310-269.000.

Yates, George A. Low profile lift attachment for a forklift. 4,273,500, Cl. 414-642.000.

Yazaki, Mutsunobu: *See*—
Matsuda, Mutsuhide; Tamamura, Hideo; Taguchi, Tetsuya; Okino, Tadashi; and Yazaki, Mutsunobu, 4,273,432, Cl. 354-145.000.

Yenawine, David L.: *See*—
Summers, Tommy L.; and Yenawine, David L., 4,273,398, Cl. 316-20.000.

Yissum Research Development Company: *See*—
Selhub, Jacob; Rachmilewitz, Bracha; and Grossowicz, Nathan, 4,273,757, Cl. 424-1.000.

Yobaccio, Edward A.: *See*—
Farmer, Zane M.; and Yobaccio, Edward A., 4,273,431, Cl. 354-59.000.

Yokohama Rubber Co., Ltd., The: *See*—
Kanamori, Katsuhiko, 4,273,682, Cl. 252-511.000.

Yokokura, Shuichi; Horie, Yu; Takamizawa, Minoru; Inoue, Yoshio; and Yoshioka, Hiroshi, to Kirin Beer Kabushiki Kaisha; and Shin-Etsu Kagako Kogyo Kabushiki Kaisha. Masking of abrasion injury on glass articles. 4,273,834, Cl. 428-429.000.

Yokono, Hitoshi: *See*—
Watanabe, Takeshi; Sudo, Ryoichi; Shoji, Fusaji; Takemoto, Issei; and Yokono, Hitoshi, 4,273,420, Cl. 350-341.000.

Yokose, Kazuteru: *See*—
Suhara, Yasuji; Ogawa, Kiyoshi; Yokose, Kazuteru; and Watanabe, Kimihiro, 4,273,765, Cl. 424-180.000.

Yokoyama, Etsuso: *See*—
Teragaki, Takeshi; Ohno, Yasuya; and Yokoyama, Etsuso, 4,273,396, Cl. 312-223.000.

Yokoyama, Takeo; Fukumoto, Kiyoshi; and Matsuura, Hiroshi, to Showa Electric Wire & Cable Co., Ltd. Interleaved multiple signal separating circuit. 4,274,108, Cl. 358-31.000.

Yoneda, Yasuhiro; Kitakohji, Toshisuke; and Kitamura, Kenro, to Fujitsu Limited. Positive resist terpolymer composition and method of forming resist pattern. 4,273,856, Cl. 430-270.000.

Yonker, John H.: *See*—
Pearce, Joseph L.; Yonker, John H.; and Deaton, Thomas M., 4,273,186, Cl. 166-72.000.

Yoshibayashi, Shigeru: *See*—
Shima, Ichiji; Yamamoto, Tatsuo; Yoshibayashi, Shigeru; Teshima, Hiroshi; Hizume, Akio; Iki, Tetsuo; Yamamoto, Takashi; Kanamori, Kyozo; and Noguchi, Kenzo, 4,272,992, Cl. 73-650.000.

Yoshida, Akio; and Ebato, Seigo, to Mitsubishi Paper Mills, Ltd. Direct-positive silver halide photographic sensitive materials. 4,273,862, Cl. 430-412.000.

Yoshida, Kooichi: *See*—
Matsuda, Akira; Yoshioka, Osamu; Takahashi, Katsutoshi; Yoshida, Kooichi; and Ninomiya, Hiroshi, 4,273,761, Cl. 424-81.000.

Yoshihara, Keisuke: *See*—
Kamada, Kazumasa; Kushi, Kenji; Yoshihara, Keisuke; and Nakamoto, Hideo, 4,273,799, Cl. 427-44.000.

Kamada, Kazumasa; Kushi, Kenji; Yoshihara, Keisuke; and Nakamoto, Hideo, 4,273,802, Cl. 427-54.100.

Yoshikawa, Shogo: *See*—
Yamamoto, Hajime; and Yoshikawa, Shogo, 4,273,535, Cl. 433-216.000.

Yoshioka, Hiroshi: *See*—
Yokokura, Shuichi; Horie, Yu; Takamizawa, Minoru; Inoue, Yoshio; and Yoshioka, Hiroshi, 4,273,834, Cl. 428-429.000.

Yoshioka, Osamu: *See*—
Matsuda, Akira; Yoshioka, Osamu; Takahashi, Katsutoshi; Yoshida, Kooichi; and Ninomiya, Hiroshi, 4,273,761, Cl. 424-81.000.

Yoshisato, Akiyuki; and Tobita, Katsumi, to Alps Electric Co., Ltd. Quartz crystal oscillator. 4,274,066, Cl. 331-116.00R.

Young, Paul R.: *See*—
Edwards, Donald W.; Young, Paul R.; and Zukovich, Thomas M., 4,273,049, Cl. 102-312.000.

Yuasa Battery Co. Ltd.: *See*—
Machi, Sueo; Ishigaki, Isao; Sugo, Takanobu; Murata, Kazuo; Tanso, Shiro; and Senoo, Keizi, 4,273,840, Cl. 429-144.000.

Yukimachi, Katsurou: *See*—
Tanaka, Shunroku; Inoue, Jun; Yukimachi, Katsurou; and Minamino, Keiichi, 4,273,184, Cl. 165-59.000.

Zachariades, Anagnostis E.: *See*—
Porter, Roger S.; and Zachariades, Anagnostis E., 4,273,739, Cl. 264-211.000.

Zaffaroni, Pasquale; Vitobello, Vincenza; and Gamalerio, Anna M., to Snamprogetti S.p.A. Method for the microbiological conversion of steroids. 4,273,872, Cl. 435-55.000.

Zamek, Otto S., to General Electric Company. Acid-terminated polyester imide wire enamels. 4,273,917, Cl. 528-288.000.

Zarnegar, Bizhan M., to Mobil Oil Corporation. Aminoplast-containing radiation curing coating compositions. 4,273,632, Cl. 204-159.150.

Zehner, Lee R.: *See*—
Vartuli, James C.; and Zehner, Lee R., 4,273,677, Cl. 252-435.000.

Zellweger, Shea. Devices for displaying or performing operations in a two-valued system. 4,273,542, Cl. 434-433.000.

Zellweger Uster, Ltd.: *See*—
Grunder, Werner; and Loch, Ernst, 4,272,868, Cl. 19-240.000.

Zenith Radio Corporation: *See*—
Lehnert, Stanley E., 4,274,110, Cl. 358-60.000.

Zenri, Hideomi. Hand carrier for cans or bottles. 4,273,273, Cl. 294-87.200.

Zimmerman, Clifton E. Method for automatic control of food forming machines. 4,273,789, Cl. 426-231.000.

Zimmerman, J. Earl. Nasal cannula. 4,273,124, Cl. 128-245.000.

Zotos International, Inc.: *See*—
Klemm, Ernest J.; Edman, Walter W.; Erskine, Frances E.; and McDonough, Everett G., 4,273,143, Cl. 132-7.000.

Zukovich, Thomas M.: *See*—
Edwards, Donald W.; Young, Paul R.; and Zukovich, Thomas M., 4,273,049, Cl. 102-312.000.

Zurcher, Allen K.: *See*—
Keeney, Gary E.; Zurcher, Allen K.; and Loomis, Ervin C., 4,273,367, Cl. 285-419.000.

Zweig, Arnold; and Hoffmann, Arthur K., to American Cyanamid Company. Stabilization of 2,2-dimethyl-4,5-benzospiro[2,4]hepta-4,6-diene-1-carboxylic acid, α-cyano-m-phenoxybenzyl ester. 4,273,764, Cl. 424-174.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 16TH DAY OF JUNE, 1981

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Blose, Thomas L., to Hydril Company. Tubular connection. Re. 30,647, Cl. 285-332.200.

Carolina Peanuts of Robersonville, Inc.: *See*—
Green, William M., Re. 30,651, Cl. 426-262.000.

Daclon, Ferruccio: *See*—
Germano, Giovanni; Losciale, Francesco; Falesiedi, Roberto; Daclon, Ferruccio; and Merzagora, Nicola, Re. 30,652, Cl. 357-28.000.

Deubel, Reinhold; Diery, Helmut; Klinner, Wolfgang; List, Karl-Hermann; and Uhrig, Heinz, to Hoechst Aktiengesellschaft. Dispersing and stabilizing agents for dyestuffs. Re. 30,650, Cl. 8-560.000.

Diery, Helmut: *See*—
Deubel, Reinhold; Diery, Helmut; Klinner, Wolfgang; List, Karl-Hermann; and Uhrig, Heinz, Re. 30,650, Cl. 8-560.000.

Falesiedi, Roberto: *See*—
Germano, Giovanni; Losciale, Francesco; Falesiedi, Roberto; Daclon, Ferruccio; and Merzagora, Nicola, Re. 30,652, Cl. 357-28.000.

Germano, Giovanni; Losciale, Francesco; Falesiedi, Roberto; Daclon, Ferruccio; and Merzagora, Nicola, to Snamprogetti S.p.A. Method for constructing a thermoelectric module and the module so obtained. Re. 30,652, Cl. 357-28.000.

Green, William M., to Carolina Peanuts of Robersonville, Inc. Process for producing a roasted peanut product. Re. 30,651, Cl. 426-262.000.

Hetz, Walter: *See*—
Ohlrogge, Wilhelm; and Hetz, Walter, Re. 30,648, Cl. 297-318.000.

Hobart Corporation: *See*—
Thompson, James W., Re. 30,649, Cl. 366-169.000.

Hoechst Aktiengesellschaft: *See*—
Deubel, Reinhold; Diery, Helmut; Klinner, Wolfgang; List, Karl-Hermann; and Uhrig, Heinz, Re. 30,650, Cl. 8-560.000.

Hydril Company: *See*—
Blose, Thomas L., Re. 30,647, Cl. 285-332.200.

International Shoe Machine Corporation: *See*—
Vornberger, Walter; and Vornberger, Karl F., Re. 30,646, Cl. 118-411.000.

Klinner, Wolfgang: *See*—
Deubel, Reinhold; Diery, Helmut; Klinner, Wolfgang; List, Karl-Hermann; and Uhrig, Heinz, Re. 30,650, Cl. 8-560.000.

List, Karl-Hermann: *See*—
Deubel, Reinhold; Diery, Helmut; Klinner, Wolfgang; List, Karl-Hermann; and Uhrig, Heinz, Re. 30,650, Cl. 8-560.000.

Losciale, Francesco: *See*—
Germano, Giovanni; Losciale, Francesco; Falesiedi, Roberto; Daclon, Ferruccio; and Merzagora, Nicola, Re. 30,652, Cl. 357-28.000.

Merzagora, Nicola: *See*—
Germano, Giovanni; Losciale, Francesco; Falesiedi, Roberto; Daclon, Ferruccio; and Merzagora, Nicola, Re. 30,652, Cl. 357-28.000.

Ohlrogge, Wilhelm; and Hetz, Walter, to Siemens Aktiengesellschaft. Chair for dental patients. Re. 30,648, Cl. 297-318.000.

Potomac Applied Mechanics, Inc.: *See*—
Stubbings, James H., Re. 30,645, Cl. 72-129.000.

Siemens Aktiengesellschaft: *See*—
Ohlrogge, Wilhelm; and Hetz, Walter, Re. 30,648, Cl. 297-318.000.

Snamprogetti S.p.A.: *See*—
Germano, Giovanni; Losciale, Francesco; Falesiedi, Roberto; Daclon, Ferruccio; and Merzagora, Nicola, Re. 30,652, Cl. 357-28.000.

Stubbings, James H., to Potomac Applied Mechanics, Inc. Method and apparatus for cutting sheet metal wrappers or the like. Re. 30,645, Cl. 72-129.000.

Thompson, James W., to Hobart Corporation. Food processing apparatus. Re. 30,649, Cl. 366-169.000.

Uhrig, Heinz: *See*—
Deubel, Reinhold; Diery, Helmut; Klinner, Wolfgang; List, Karl-Hermann; and Uhrig, Heinz, Re. 30,650, Cl. 8-560.000.

Vornberger, Karl F.: *See*—
Vornberger, Walter; and Vornberger, Karl F., Re. 30,646, Cl. 118-411.000.

Vornberger, Walter; and Vornberger, Karl F., to International Shoe Machine Corporation. Cement side and heel lasting machine. Re. 30,646, Cl. 118-411.000.

LIST OF DESIGN PATENTEES

A.L.A. Industries, Inc.: *See*—
Haagedoorn, Anton; and Merlin, Philip, 259,544, Cl. D9-419.000.

Aktiebolaget Volvo: *See*—
Lindfors, Olof H., 259,552, Cl. D12-57.000.

Amerock Corporation: *See*—
Pittenger, Teresa R. B., 259,539, Cl. D8-310.000.

Anderson, Olof V., to Anson Incorporated. Casing for a writing instrument. 259,574, 6-16-81, Cl. D19-48.000.

Anson Incorporated: *See*—
Anderson, Olof V., 259,574, Cl. D19-48.000.

Aquarian, Amon. Swing. 259,582, 6-16-81, Cl. D21-246.000.

Arasim, Stanley J., Jr.; and Voitas, Edward J., to Mosler Safe Company, The. Remote service conveyor unit. 259,571, 6-16-81, Cl. D18-35.000.

Baeza, Armando. Toy football player figure. 259,577, 6-16-81, Cl. D21-177.000.

Barr, Joy L. Ice skating boot warmer. 259,521, 6-16-81, Cl. D2-272.000.

Bartholomew, Dominic R., Jr.; and Waltz, Albert R., to Hughes Aircraft Company. Stackable tray or similar article. 259,527, 6-16-81, Cl. D6-114.000.

Basile, Peter A.: *See*—
Halbeisen, Jack; Basile, Peter A.; and Bochmann, Carl E., 259,541, Cl. D9-300.000.

Baum, Elliot I., to Quasar Microsystems, Inc. Telephone answering machine. 259,561, 6-16-81, Cl. D14-4.000.

Bidegain, Pierre, to Bidegain S.A. Baby shoe. 259,522, 6-16-81, Cl. D2-278.000.

Bidegain S.A.: *See*—
Bidegain, Pierre, 259,522, Cl. D2-278.000.

Bochmann, Carl E.: *See*—
Halbeisen, Jack; Basile, Peter A.; and Bochmann, Carl E., 259,541, Cl. D9-300.000.

Bowling, B. David. Spring-compressing tool. 259,538, 6-16-81, Cl. D8-59.000.

Bulten-Kanthal AB: *See*—
Svensson, Stig, 259,540, Cl. D8-367.000.

Burlington Industries, Inc.: *See*—
Crane, Robert; and Mayerson, Seymour, 259,528, Cl. D6-157.000.

Carloni, August G.: *See*—
Robinson, Richard T., 259,553, Cl. D12-308.000.

Carreiro, Ronald. Toy helmet. 259,578, 6-16-81, Cl. D21-190.000.

Chin, Bing-Yiu, to Goodway Manufacturing Limited. Hair styler. 259,589, 6-16-81, Cl. D28-35.000.

Clarke-Gravely Corporation: *See*—
Phillips, Paul E., 259,566, Cl. D15-49.000.

Clement, Joseph J. Toy telephone. 259,576, 6-16-81, Cl. D21-111.000.

Clorox Company, The: *See*—
Halbeisen, Jack; Basile, Peter A.; and Bochmann, Carl E., 259,541, Cl. D9-300.000.

Commisso, Nicholas D.; and Palmer, Dwight O., to Mobil Oil Corporation. Covered container or the like. 259,543, 6-16-81, Cl. D9-426.000.

Crane, Robert; and Mayerson, Seymour, to Burlington Industries, Inc. Display stand for merchandise. 259,528, 6-16-81, Cl. D6-157.000.

Daenen, Robert H. C. M.; and De Coster, Pieter K. J., to Dart Industries Inc. Grater or the like. 259,534, 6-16-81, Cl. D7-47.000.

Daenen, Robert H. C. M., to Dart Industries Inc. Colander or the like. 259,535, 6-16-81, Cl. D7-47.000.

Dart Industries Inc.: *See*—
Daenen, Robert H. C. M.; and De Coster, Pieter K. J., 259,534, Cl. D7-47.000.
Daenen, Robert H. C. M., 259,535, Cl. D7-47.000.

De Coster, Pieter K. J.: *See*—
Daenen, Robert H. C. M.; and De Coster, Pieter K. J., 259,534, Cl. D7-47.000.

Douglas, Fred O., to W. C. Bradley Co. Height adjustment means for selective spacing between circular cooking grill and hanging fire grate. 259,536, 6-16-81, Cl. D7-129.000.

Dura Plastics of New York: *See*—
Korzon, Edward S., 259,530, Cl. D6-183.000.

Erdman, Bruce. Tambour jewelry box. 259,524, 6-16-81, Cl. D3-75.000.

Ethyl Development Corporation: *See*—
Shortino, Vincent M., 259,542, Cl. D9-403.000.

Frodsham, Vaughn D., to Huntington, Howard L., a part interest. Spoon straw. 259,533, 6-16-81, Cl. D7-42.000.

General Electric Company: *See*—
Huntington, Robert R., 259,564, Cl. D14-68.000.

Godo Kigyo Co., Ltd.: *See*—
Watanabe, Ikuo, 259,565, Cl. D14-96.000.

Goodway Manufacturing Limited: *See*—
Chin, Bing-Yiu, 259,589, Cl. D28-35.000.

Grange, Kenneth, to Kenwood Cascade Company Limited. Carbonating machine for drinks. 259,567, 6-16-81, Cl. D15-112.000.

Gross, David A. Combined aquarium cover and stand. 259,593, 6-16-81, Cl. D30-10.000.

Haagedoorn, Anton; and Merlin, Philip, to A.L.A. Industries, Inc. Twist tie dispensing package. 259,544, 6-16-81, Cl. D9-419.000.

Halbeisen, Jack; Basile, Peter A.; and Bochmann, Carl E., to Clorox Company, The. Fluid dispenser. 259,541, 6-16-81, Cl. D9-300.000.

Heritage Products Corp.: *See*—
Steele, Walter E.; and Upham, George W., 259,532, Cl. D6-249.000.

Heuberger, Lawrence K.: *See*—
Parise, Carl; and Heuberger, Lawrence K., 259,554, Cl. D12-332.000.

Hishino Gakki Ten, Inc.: *See*—
Hoshino, Masao, 259,570, Cl. D17-20.000.

Hitachi, Ltd.: *See*—
Mochizuki, Hidetoshi; Otsuki, Keizo; Kosaka, Hideki; and Murakami, Gen, 259,559, Cl. D13-99.000.
Mochizuki, Hidetoshi; Otsuki, Keizo; Kosaka, Hideki; and Murakami, Gen, 259,560, Cl. D13-99.000.

Hopper, M. Almeda. Crochet tool. 259,523, 6-16-81, Cl. D3-28.000.

Hoshino, Masao, to Hishino Gakki Ten, Inc. Stringed instrument head. 259,570, 6-16-81, Cl. D17-20.000.

Hughes Aircraft Company: *See*—
Bartholomew, Dominic R., Jr.; and Waltz, Albert R., 259,527, Cl. D6-114.000.

Huntington, Howard L.: *See*—
Frodsham, Vaughn D., 259,533, Cl. D7-42.000.

Huntington, Robert R., to General Electric Company. Portable radio transmitter and receiver housing. 259,564, 6-16-81, Cl. D14-68.000.

Hydro Service & Supplies, Inc.: *See*—
Riley, Charles D.; and Waddell, Charles G., 259,584, Cl. D23-19.000.

Irving Kaye Company, Inc.: *See*—
Kaye, Arnold, 259,579, Cl. D21-232.000.
Kaye, Arnold, 259,580, Cl. D21-232.000.

J. Gerber and Co., (Japan) Ltd.: *See*—
Nishioka, Shigeo, 259,569, Cl. D16-01.000.

Jacobs, Andre. Mobile. 259,549, 6-16-81, Cl. D11-141.000.

Jergenson, Philip E., to Proto Plant Inc. Smoking pipe. 259,587, 6-16-81, Cl. D27-03.000.

Johnson, Dennis E., to McGraw-Edison Company. Task light fixture. 259,586, 6-16-81, Cl. D26-76.000.

Kane, Shirley. Combined table and umbrella. 259,525, 6-16-81, Cl. D6-4.000.

Kaye, Arnold, to Irving Kaye Company, Inc. Pool table. 259,579, 6-16-81, Cl. D21-232.000.

Kaye, Arnold, to Irving Kaye Company, Inc. Pool table. 259,580, 6-16-81, Cl. D21-232.000.

Kenwood Cascade Company Limited: *See*—
Grange, Kenneth, 259,567, Cl. D15-112.000.

Kola, Walter T. Stand for plants or flowers. 259,529, 6-16-81, Cl. D6-179.000.

Korzon, Edward S., to Dura Plastics of New York. Plant ladder. 259,530, 6-16-81, Cl. D6-183.000.

Kosaka, Hideki: *See*—
Mochizuki, Hidetoshi; Otsuki, Keizo; Kosaka, Hideki; and Murakami, Gen, 259,559, Cl. D13-99.000.
Mochizuki, Hidetoshi; Otsuki, Keizo; Kosaka, Hideki; and Murakami, Gen, 259,560, Cl. D13-99.000.

Kretschmer, Eric H. Magnetic toy. 259,581, 6-16-81, Cl. D21-240.000.

Lazzeroni, Edward J., to Miller Tilt-Top Trailer, Inc. Trailer hitch. 259,555, 6-16-81, Cl. D12-162.000.

Lindfors, Olof H., to Aktiebolaget Volvo. Remote controlled fork truck. 259,552, 6-16-81, Cl. D12-57.000.

MacLean, Charles A. Horseman figure. 259,550, 6-16-81, Cl. D11-159.000.

Marshall, Anthony M. Telephone instrument stand. 259,563, 6-16-81, Cl. D14-60.000.

Mayerson, Seymour: *See*—
Crane, Robert; and Mayerson, Seymour, 259,528, Cl. D6-157.000.

McGraw-Edison Company: *See*—
Johnson, Dennis E., 259,586, Cl. D26-76.000.

Merlin, Philip: *See*—
Haagedoorn, Anton; and Merlin, Philip, 259,544, Cl. D9-419.000.

Metalfab Industries, Inc.: *See*—
Norris, Carl V., 259,556, Cl. D12-169.000.
Norris, Carl V., 259,557, Cl. D12-169.000.

Metz, Thomas V.; and Sirois, W. James, to Pacific Fireplace Furnishings, Inc. Fireplace heat exchanger. 259,585, 6-16-81, Cl. D23-95.000.

Miller Tilt-Top Trailer, Inc.: *See*—
Lazzeroni, Edward J., 259,555, Cl. D12-162.000.

Mobil Oil Corporation: *See*—
Commisso, Nicholas D.; and Palmer, Dwight O., 259,543, Cl. D9-426.000.

Mochizuki, Hidetoshi; Otsuki, Keizo; Kosaka, Hideki; and Murakami, Gen, to Hitachi, Ltd. Semiconductor. 259,559, 6-16-81, Cl. D13-99.000.

Mochizuki, Hidetoshi; Otsuki, Keizo; Kosaka, Hideki; and Murakami, Gen, to Hitachi, Ltd. Semiconductor. 259,560, 6-16-81, Cl. D13-99.000.

Mosler Safe Company, The: *See*—
Arasim, Stanley J., Jr.; and Voitas, Edward J., 259,571, Cl. D18-35.000.

Mulee, Dennis L. Insect electrocuter. 259,583, 6-16-81, Cl. D22-19.000.

Murakami, Gen: *See*—
Mochizuki, Hidetoshi; Otsuki, Keizo; Kosaka, Hideki; and Murakami, Gen, 259,559, Cl. D13-99.000.
Mochizuki, Hidetoshi; Otsuki, Keizo; Kosaka, Hideki; and Murakami, Gen, 259,560, Cl. D13-99.000.

Nagode, Larry R., to Quaker Oats Company, The. Handle for a toy article of flatware. 259,575, 6-16-81, Cl. D21-109.000.

Najjar, Benayahu L. Diamond. 259,548, 6-16-81, Cl. D11-90.000.

Nishioka, Shigeo, to J. Gerber and Co., (Japan) Ltd. Combined camera and binoculars. 259,569, 6-16-81, Cl. D16-01.000.

Norris, Carl V., to Metalfab Industries, Inc. Vehicle bumper. 259,556, 6-16-81, Cl. D12-169.000.

Norris, Carl V., to Metalfab Industries, Inc. Vehicle bumper. 259,557, 6-16-81, Cl. D12-169.000.

Oatman, Lloyd L. Television support stand or similar article. 259,551, 6-16-81, Cl. D12-25.000.

Orion Industries, Inc.: *See*—
Swenson, Kendall, 259,568, Cl. D15-125.000.

Ostermaier, Albert E. Flexible link fastener for horse blankets or the like. 259,592, 6-16-81, Cl. D30-37.000.

Otsuki, Keizo: *See*—
Mochizuki, Hidetoshi; Otsuki, Keizo; Kosaka, Hideki; and Murakami, Gen, 259,559, Cl. D13-99.000.
Mochizuki, Hidetoshi; Otsuki, Keizo; Kosaka, Hideki; and Murakami, Gen, 259,560, Cl. D13-99.000.

Owens-Corning Fiberglas Corporation: *See*—
Weitzman, Mark R., 259,594, Cl. D92-1.100.

Pacific Fireplace Furnishings, Inc.: *See*—
Metz, Thomas V.; and Sirois, W. James, 259,585, Cl. D23-95.000.

Palmer, Dwight O.: *See*—
Commisso, Nicholas D.; and Palmer, Dwight O., 259,543, Cl. D9-426.000.

Parise, Carl; and Heuberger, Lawrence K. Aircraft. 259,554, 6-16-81, Cl. D12-332.000.

Phillips, Paul E., to Clarke-Gravely Corporation. Carpet extractor. 259,566, 6-16-81, Cl. D15-49.000.

Pittenger, Teresa R. B., to Amerock Corporation. Knob. 259,539, 6-16-81, Cl. D8-310.000.

Proto Plant Inc.: *See*—
Jergenson, Philip E., 259,587, Cl. D27-03.000.

Prouty, Thomas D.; and Smith, Bruce A. Closeable weatherproof blanket for children. 259,531, 6-16-81, Cl. D6-201.000.

Quaker Oats Company, The: *See*—
Nagode, Larry R., 259,575, Cl. D21-109.000.

Quasar Microsystems, Inc.: *See*—
Baum, Elliot I., 259,561, Cl. D14-4.000.

Ralston, Larry L., Jr. Combination tennis racket and hand grip material display stand. 259,526, 6-16-81, Cl. D6-23.000.

Rappaport, Milton, to Vendome Headwear Inc. Cap. 259,520, 6-16-81, Cl. D2-244.000.

Renaud, Jean-Claude. Greeting card. 259,572, 6-16-81, Cl. D19-1.000.

Renaud, Jean-Claude. Greeting card. 259,573, 6-16-81, Cl. D19-1.000.

Riley, Charles D.; and Waddell, Charles G., to Hydro Service & Supplies, Inc. Valve. 259,584, 6-16-81, Cl. D23-19.000.

Robinson, Richard T., to Carloni, August G. Submarine. 259,553, 6-16-81, Cl. D12-308.000.

Rocheleau, Ulric M. Multi-rule. 259,545, 6-16-81, Cl. D10-65.000.

Rowenta-Werke GmbH: *See*—
Stutzer, Franz A., 259,588, Cl. D27-42.000.

Rubbermaid Incorporated: *See*—
Taylor, William D., 259,537, Cl. D7-188.000.

Schoenig, Darrell A. Speaker stand. 259,562, 6-16-81, Cl. D14-38.000.

Shortino, Vincent M., to Ethyl Development Corporation. Bottle or similar article. 259,542, 6-16-81, Cl. D9-403.000.

Simon, Morris. Design for combined ruler and magnifying caliper. 259,546, 6-16-81, Cl. D10-65.000.

Simpson, Lee. Wire wheel center for a truck. 259,558, 6-16-81, Cl. D12-205.000.

Sirois, W. James: *See*—
Metz, Thomas V.; and Sirois, W. James, 259,585, Cl. D23-95.000.

Smith, Bruce A.: *See*—
Prouty, Thomas D.; and Smith, Bruce A., 259,531, Cl. D6-201.000.

Steele, Walter E.; and Upham, George W., to Heritage Products Corp. Combined garment hanger and over-the-shoulder carrier. 259,532, 6-16-81, Cl. D6-249.000.

Stutzer, Franz A., to Rowenta-Werke GmbH. Lighter. 259,588, 6-16-81, Cl. D27-42.000.

Svensson, Stig, to Bulten-Kanthal AB. Safety hook. 259,540, 6-16-81, Cl. D8-367.000.

Swenson, Kendall, to Orion Industries, Inc. Plug cleaner. 259,568, 6-16-81, Cl. D15-125.000.

Taylor, William D., to Rubbermaid Incorporated. Folding dish drainer. 259,537, 6-16-81, Cl. D7-188.000.

Texidor, Genaro. Pen ring. 259,547, 6-16-81, Cl. D11-2.000.

U.S. Philips Corporation: *See*—
Yran, Knut O., 259,590, Cl. D28-50.000.
Yran, Knut O., 259,591, Cl. D28-50.000.

Upham, George W.: *See*—
Steele, Walter E.; and Upham, George W., 259,532, Cl. D6-249.000.

Vendome Headwear Inc.: *See*—
Rappaport, Milton, 259,520, Cl. D2-244.000.

Voitas, Edward J.: *See*—
Arasim, Stanley J., Jr.; and Voitas, Edward J., 259,571, Cl. D18-35.000.

W. C. Bradley Co.: *See*—
Douglas, Fred O., 259,536, Cl. D7-129.000.

Waddell, Charles G.: *See*—
Riley, Charles D.; and Waddell, Charles G., 259,584, Cl. D23-19.000.

Waltz, Albert R.: *See*—
Bartholomew, Dominic R., Jr.; and Waltz, Albert R., 259,527, Cl. D6-114.000.

Watanabe, Ikuo, to Godo Kigyo Co., Ltd. Mounted amplifier. 259,565, 6-16-81, Cl. D14-96.000.

Weitzman, Mark R., to Owens-Corning Fiberglas Corporation. Embossed plastic sheet material. 259,594, 6-16-81, Cl. D92-1.100.

Yran, Knut O., to U.S. Philips Corporation. Electric dry shaver. 259,590, 6-16-81, Cl. D28-50.000.

Yran, Knut O., to U.S. Philips Corporation. Shaving cutter holder. 259,591, 6-16-81, Cl. D28-50.000.

LIST OF PLANT PATENTEES

Auvil Fruit Co., Inc.: *See*—
Cooper, Calvin L., 4,741, Cl. 34.000.

Cooper, Calvin L., to Auvil Fruit Co., Inc., a part interest. Granny Smith apple tree (greenspur strain). 4,741, 6-16-81, Cl. 34.000.

Hope, Claude, to Pan-American Plant Company. Kalanchoe named Pueblo. 4,744, 6-16-81, Cl. 68.000.

Hope, Claude, to Pan-American Plant Company. Kalanchoe named Yucatan. 4,745, 6-16-81, Cl. 68.000.

Mikkelsen, James C.; and van den Berg, Cornelis P., to Mikkelsens Inc. Begonia plant. 4,743, 6-16-81, Cl. 68.000.

Mikkelsens Inc.: *See*—
Mikkelsen, James C.; and van den Berg, Cornelis P., 4,743, Cl. 68.000.
Van den Berg, Cornelis P., 4,742, Cl. 68.000.

Pan-American Plant Company: *See*—
Hope, Claude, 4,744, Cl. 68.000.
Hope, Claude, 4,745, Cl. 68.000.

Van den Berg, Cornelis P., to Mikkelsens Inc. Begonia plant. 4,742, 6-16-81, Cl. 68.000.

van den Berg, Cornelis P.: *See*—
Mikkelsen, James C.; and van den Berg, Cornelis P., 4,743, Cl. 68.000.

CLASSIFICATION OF PATENTS

ISSUED JUNE 16, 1981

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

2 4,272,847
4,272,848
16 4,272,849
24 4,272,850
79 4,272,851
94 4,272,852
424 4,272,853

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232 E 4,273,559

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526 R 4,272,878
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161 4,272,887
229 4,272,888
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179.5 B 4,272,891
185 R 4,272,892

CLASS 34

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CLASS 36

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21 C 4,272,900
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47 4,272,911
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CLASS 56

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473 R 4,273,004
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106 4,273,579
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57.38 4,273,011
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93.04 4,273,040
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321 4,273,050
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CLASS 104

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CLASS 105

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CLASS 106

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73.4 4,273,587
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CLASS 111

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121.14 4,273,059

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219 4,273,065
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CLASS 119

14.51 4,273,070
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27 4,273,072

CLASS 122

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7 R 4,273,074
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299 4,273,087
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CLASS 148

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180 4,273,600
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234 4,273,602
236 4,273,603
286 4,273,605
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540 4,273,607
605 4,273,608
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84 VF 4,273,965
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115.5 PV 4,273,968
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CLASS 208

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CLASS 209

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	278	259,522			259,535		90	259,548	D14—	4	259,561			259,573		95	259,585
D3—	28	259,523		129	259,536		141	259,549		38	259,562		48	259,574	D26—	76	259,586
	75	259,524		188	259,537		159	259,550		60	259,563	D21—	109	259,575	D27—	03	259,587
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	23	259,526		310	259,539		57	259,552		96	259,565		177	259,577	D28—	35	259,589
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	157	259,528	D9—	300	259,541		169	259,556		112	259,567		232	259,579			259,591
	179	259,529		403	259,542			259,557		125	259,568			259,580	D30—	10	259,593
	183	259,530		419	259,544		205	259,558	D16—	01	259,569		240	259,581		37	259,592
	201	259,531		426	259,543		308	259,553	D17—	20	259,570		246	259,582	D92—	1.1	259,594
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18 : 4,273,139
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4,743

53 : 4,741

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